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(71) Applicant (for all designated States except US): HUMAN GENOME SCIENCES, INC. [US/US]; 9410 Key West Avenue, Rockville, MD 20850 (US).			
(72) Inventors; and			
(75) Inventors/Applicants (for US only): MOORE, Paul, A. [US/US]; 19005 Leatherbark Drive, Germantown, MD			
		20874 (US). RUBEN, Steven, M. [US/US]; 18528 Heritage Hills Drive, Olney, MD 20832 (US). CARTER, Kenneth, C. [US/US]; 11601 Brandy Hall Lane, North Potomac, MD 20878 (US). SHI, Yang-gu [CN/US]; 437 West Side Drive, Gaithersburg, MD 20878 (US). ROSEN, Craig, A. [US/US]; 22400 Rolling Hill Road, Laytonsville, MD 20882 (US). SOPPET, Daniel, R. [US/US]; 15050 Stillfield Place, Centreville, VA 22020 (US). KYAW, Hla [MM/US]; 520 Sugarbush Circle, Frederick, MD 21703 (US). WEI, Ying-Fei [CN/US]; 1714-C Marina Court, San Mateo, CA 94403 (US). FLORENCE, Kimberly [US/US]; 12805 Atlantic Avenue, Rockville, MD 20851 (US). DUAN, Roxanne, D. [US/US]; 5515 Northfield Road, Bethesda, MD 20817 (US). FLORENCE, Charles [US/US]; 12805 Atlantic Avenue, Rockville, MD 20851 (US). GREENE, John, M. [US/US]; 872 Diamond Drive, Gaithersburg, MD 20878 (US). FENG, Ping [CN/US]; 4 Relda Court, Gaithersburg, MD 20878 (US). FERRIE, Ann, M. [US/US]; 120 Fox Run Drive, Tewksbury, MA 01876 (US). YU, Guo-Liang [CN/US]; 1714-C Marina Court, San Mateo, CA 94403 (US). JANAT, Fouad [SY/US]; 140 High Street, No. 202, Westerly, RI 02891 (US). NI, Jian [CN/US]; 5502 Manorfield Road, Rockville, MD 20853 (US).	
		(74) Agents: BROOKES, A., Anders et al.; Human Genome Sciences, Inc., 9410 Key West Avenue, Rockville, MD 20850 (US).	
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(54) Title: 110 HUMAN SECRETED PROTEINS			
(57) Abstract			
The present invention relates to novel human secreted proteins and isolated nucleic acids containing the coding regions of the genes encoding such proteins. Also provided are vectors, host cells, antibodies, and recombinant methods for producing human secreted proteins. The invention further relates to diagnostic and therapeutic methods useful for diagnosing and treating disorders related to these novel human secreted proteins.			

110 Human Secreted Proteins

Field of the Invention

This invention relates to newly identified polynucleotides and the polypeptides encoded by these polynucleotides, uses of such polynucleotides and polypeptides, and their production.

Background of the Invention

Unlike bacterium, which exist as a single compartment surrounded by a membrane, human cells and other eucaryotes are subdivided by membranes into many functionally distinct compartments. Each membrane-bounded compartment, or organelle, contains different proteins essential for the function of the organelle. The cell uses "sorting signals," which are amino acid motifs located within the protein, to target proteins to particular cellular organelles.

One type of sorting signal, called a signal sequence, a signal peptide, or a leader sequence, directs a class of proteins to an organelle called the endoplasmic reticulum (ER). The ER separates the membrane-bounded proteins from all other types of proteins. Once localized to the ER, both groups of proteins can be further directed to another organelle called the Golgi apparatus. Here, the Golgi distributes the proteins to vesicles, including secretory vesicles, the cell membrane, lysosomes, and the other organelles.

Proteins targeted to the ER by a signal sequence can be released into the extracellular space as a secreted protein. For example, vesicles containing secreted proteins can fuse with the cell membrane and release their contents into the extracellular space - a process called exocytosis. Exocytosis can occur constitutively or after receipt of a triggering signal. In the latter case, the proteins are stored in secretory vesicles (or secretory granules) until exocytosis is triggered. Similarly, proteins residing on the cell membrane can also be secreted into the extracellular space by proteolytic cleavage of a "linker" holding the protein to the membrane.

Despite the great progress made in recent years, only a small number of genes encoding human secreted proteins have been identified. These secreted proteins include the commercially valuable human insulin, interferon, Factor VIII, human growth hormone, tissue plasminogen activator, and erythropoietin. Thus, in light of the pervasive role of secreted proteins in human physiology, a need exists for identifying and characterizing novel human secreted proteins and the genes that encode them. This knowledge will allow one to detect, to treat, and to prevent medical disorders by using secreted proteins or the genes that encode them.

analysis). A representative clone containing all or most of the sequence for SEQ ID NO:X was deposited with the American Type Culture Collection ("ATCC"). As shown in Table 1, each clone is identified by a cDNA Clone ID (Identifier) and the ATCC Deposit Number. The ATCC is located at 10801 University Boulevard,
5 Manassas, Virginia 20110-2209, USA. The ATCC deposit was made pursuant to the terms of the Budapest Treaty on the international recognition of the deposit of microorganisms for purposes of patent procedure.

A "polynucleotide" of the present invention also includes those polynucleotides capable of hybridizing, under stringent hybridization conditions, to sequences contained
10 in SEQ ID NO:X, the complement thereof, or the cDNA within the clone deposited with the ATCC. "Stringent hybridization conditions" refers to an overnight incubation at 42° C in a solution comprising 50% formamide, 5x SSC (750 mM NaCl, 75 mM sodium citrate), 50 mM sodium phosphate (pH 7.6), 5x Denhardt's solution, 10% dextran sulfate, and 20 µg/ml denatured, sheared salmon sperm DNA, followed by washing the
15 filters in 0.1x SSC at about 65°C.

Also contemplated are nucleic acid molecules that hybridize to the polynucleotides of the present invention at lower stringency hybridization conditions. Changes in the stringency of hybridization and signal detection are primarily accomplished through the manipulation of formamide concentration (lower percentages
20 of formamide result in lowered stringency); salt conditions, or temperature. For example, lower stringency conditions include an overnight incubation at 37°C in a solution comprising 6X SSPE (20X SSPE = 3M NaCl; 0.2M NaH₂PO₄; 0.02M EDTA, pH 7.4), 0.5% SDS, 30% formamide, 100 µg/ml salmon sperm blocking DNA; followed by washes at 50°C with 1XSSPE, 0.1% SDS. In addition, to achieve even
25 lower stringency, washes performed following stringent hybridization can be done at higher salt concentrations (e.g. 5X SSC).

Note that variations in the above conditions may be accomplished through the inclusion and/or substitution of alternate blocking reagents used to suppress background in hybridization experiments. Typical blocking reagents include
30 Denhardt's reagent, BLOTTO, heparin, denatured salmon sperm DNA, and commercially available proprietary formulations. The inclusion of specific blocking reagents may require modification of the hybridization conditions described above, due to problems with compatibility.

Of course, a polynucleotide which hybridizes only to polyA⁺ sequences (such
35 as any 3' terminal polyA⁺ tract of a cDNA shown in the sequence listing), or to a

formation of pyroglutamate, formylation, gamma-carboxylation, glycosylation, GPI anchor formation, hydroxylation, iodination, methylation, myristoylation, oxidation, pegylation, proteolytic processing, phosphorylation, prenylation, racemization, selenoylation, sulfation, transfer-RNA mediated addition of amino acids to proteins such as arginylation, and ubiquitination. (See, for instance, PROTEINS - STRUCTURE AND MOLECULAR PROPERTIES, 2nd Ed., T. E. Creighton, W. H. Freeman and Company, New York (1993); POSTTRANSLATIONAL COVALENT MODIFICATION OF PROTEINS, B. C. Johnson, Ed., Academic Press, New York, pgs. 1-12 (1983); Seifter et al., Meth Enzymol 182:626-646 (1990); Rattan et al., Ann NY Acad Sci 663:48-62 (1992).)

"SEQ ID NO:X" refers to a polynucleotide sequence while "SEQ ID NO:Y" refers to a polypeptide sequence, both sequences identified by an integer specified in Table 1.

"A polypeptide having biological activity" refers to polypeptides exhibiting activity similar, but not necessarily identical to, an activity of a polypeptide of the present invention, including mature forms, as measured in a particular biological assay, with or without dose dependency. In the case where dose dependency does exist, it need not be identical to that of the polypeptide, but rather substantially similar to the dose-dependence in a given activity as compared to the polypeptide of the present invention (i.e., the candidate polypeptide will exhibit greater activity or not more than about 25-fold less and, preferably, not more than about tenfold less activity, and most preferably, not more than about three-fold less activity relative to the polypeptide of the present invention.)

Polynucleotides and Polypeptides of the Invention

FEATURES OF PROTEIN ENCODED BY GENE NO: 1

The translation product of this gene shares sequence homology with a neurogenic secreted signaling protein, in addition to the human UDP-galactose:2-acetamido-2-deoxy-D-glucose3beta-galactosyltransferase (See Genbank Accession No. gnl|PIDle1237254) which is thought to be vital in glycoprotein biosynthesis. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: GLGPAQVALSLQGPA (SEQ ID NO:239), SSWMAGTQPRTSWWEMSS AKPCPTGTLRSNTSSHPQCTGPPTTHPMLVGEDMSCPEPQCGASRLSWKMNS

not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. In addition, the protein may show utility in the creation of novel therapeutics which depend upon the localizing benefits (cell and tissue specificity) of glycoproteins. This protein may also be used to produce physiologically active saccharide chains and variants, and for improvement of saccharide chains bound to physiologically active proteins. Expression within fetal tissue and other cellular sources marked by proliferating cells indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:11 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1257 of SEQ ID NO:11, b is an integer of 15 to 1271, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:11, and where b is greater than or equal to a + 14.

35 FEATURES OF PROTEIN ENCODED BY GENE NO: 2

The tissue distribution in testis indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention for abnormalities of the reproductive system. In addition, expression of this gene product in the testis may implicate this gene product in normal testicular function. This gene product may be useful in the treatment of male infertility, and/or could be used as a male contraceptive. Moreover, the protein product of this gene may be useful in the treatment, detection, and/or prevention of a variety of disorders related to androgen-regulated tissues, particularly the prostate gland. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:12 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1437 of SEQ ID NO:12, b is an integer of 15 to 1451, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:12, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 3

The translation product of this gene shares sequence homology with the human VAKTI precursor (See Genbank Accession No. gnllPIDle1311078 (AJ228139)), in addition to the ovoinhibitor and thrombin inhibitors, which are thought to be important in inhibition of protease activities. Contact of cells with supernatant expressing the product of this gene has been shown to increase the permeability of the plasma membrane of monocytes to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product binds a receptor on the surface of the plasma membrane of both immune cells, in addition to other cell-lines or tissue cell types. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating monocytes. Binding of a ligand to a receptor is known to alter intracellular levels of small molecules, such as calcium, potassium and sodium, as well as alter pH and membrane potential. Alterations in small molecule concentration can be measured to identify supernatants which bind to

FVVQM (SEQ ID NO:275), and/or VKPTSKQKMKKRKRLKHELETKENL (SEQ ID NO:276). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 5. Accordingly, polynucleotides related to this invention are useful as a marker in

5 linkage analysis for chromosome 5.

This gene is expressed primarily in heart, tonsils, Hodgkin's lymphoma, neuroblastoma, leukocyte and lung.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, cardiovascular, immune, or hemodynamic disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the circulatory system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., cardiovascular, muscle, immune, hematopoietic, pulmonary, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, pulmonary surfactant or sputum, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:127 as residues: Ala-20 to Gln-27.

The tissue distribution in heart and immune cells and tissues, the homology to protease inhibitors, in addition to the detected calcium flux, EGR1, and GAS biological activities indicates polynucleotides and polypeptides corresponding to this gene are useful for diagnosis and treatment of hemodynamic or vascular disorders, including hemorrhage, heart failure, and embolism, because proteases and their inhibitors are often involved in the cascades controlling hemodynamic controls. Protein may also show utility in the treatment, detection, and/or prevention of a variety of metabolic (i.e. cellular or physiological) and/or proliferative disorders in which aberrant regulation of a protease is thought to be involved, particularly in the premature activation of zymogens, for example. The secreted protein can also be used to determine biological activity, to raise antibodies, as tissue markers, to isolate cognate ligands or receptors, to identify agents that modulate their interactions and as nutritional supplements. It may also have a very wide range of biological activities. Typical of these are cytokine, cell proliferation/differentiation modulating activity or induction of other cytokines;

RWFSSCPLAHSWPTHSWPPVSLCCASRSLPRPAPQAQPALAP (SEQ ID NO:280), LSMPWPPMGSSSRCLPMCTPGHRC (SEQ ID NO:281), APWRSGSS RPSWHCCWTWSRWFSSCPL (SEQ ID NO:282), THSWPPVSLCCASRSL PRPAPQ (SEQ ID NO:283), AYILVSTVL TLMVPWHS LDPDSALADAFYQRGYRW
 5 AGFIVAAGSICAMNTVLLSLLFSLP (SEQ ID NO:284), PWHSLDPDSALADAF YQRGYRWAGFIVAAGS (SEQ ID NO:285), RIVYAMAADGLFFQVFAHVHPRTQ VPV (SEQ ID NO:286), DLESLVQFLSLGTLA (SEQ ID NO:287), YTFVATSII VLRFAQK (SEQ ID NO:288), LTKQQSSFSDDLQLVGTVHASVPEPGELKPA (SEQ ID NO:289), LRPYLGFLDGYS PGAVVTWALGVMLASAITIGCVLVFGNSTL
 10 HLPHWGYI (SEQ ID NO:290), PGAVVTWALGVMLASAITIGCVLVFGN (SEQ ID NO:291), GAHQQQYREDLFQIPMVPLIPALSIVLNICLMLKLSYLTWVRFSIW LLMGLAV (SEQ ID NO:292), MVPLIPALSIVLNICLMLKLSYLTWV (SEQ ID NO:293), and/or YFGYGIRHSKENQREL PGLNSTHYVVFPR (SEQ ID NO:294). Polynucleotides encoding these polypeptides are also encompassed by the invention.

15 This gene is expressed primarily in placenta and brain tissue.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, neural, or metabolic disorders, in addition to viral
 20 infections. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system and placenta, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g.,
 25 reproductive, neural, hepatic, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, bile, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

30 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:128 as residues: Gln-87 to Ser-99, Pro-102 to Phe-110, Gln-204 to Leu-211, Ser-262 to Glu-268, Pro-294 to His-305.

The tissue distribution in placenta, combined with the homology to a retroviral receptor and cationic amino acid transporters, indicates polynucleotides and
 35 polypeptides corresponding to this gene are useful for the diagnosis and intervention of viral infections, or diseases and malfunctions related to amino acid transport. Specifically, soluble forms of this protein or, polynucleotides of the present invention,

GQRQLGHVGPNNHRHGRPRPGPCRWPDGAR ADGTAGTL (SEQ ID NO:296),
 PGSTPLASFKILALESADGHGGCSAGNDI (SEQ ID NO:297), GERDDQQVF
 IQKVVPSASQLFVRL (SEQ ID NO:298), RSVDGSPTTAFTVLECEGSPAARLS
 (SEQ ID NO:299), PALPAHWPGQRQLGHVGPNNHRHGRPR (SEQ ID NO:300),
 5 PFIPRRPWPEPGVPTGIREAPESPRTRASQGIMAAALFKKEVSLSFILGGVVRG
 VPRPLEGHGAGVGGRRRSGLRTSSWQRSTKLPPRRRRASACGGLGLPRWP
 DKEVLLEAEWRLVREMRGEGLGRQPHEGAERSRRGQLTVFQLFHQLLLRQATC
 RGLA EAVHGGG (SEQ ID NO:301), PGVPTGIREAPESPRTRASQGIMAAALF
 KKEV (SEQ ID NO:302), FILGGVVRGVPRPLEGHGAGVGGRRRSGLP (SEQ ID
 10 NO:303), GLPRWPDKEVLLEAEWRLVREMRG (SEQ ID NO:304), and/or GAER
 SRRGQLTVFQLFHQLLLRQ (SEQ ID NO:305). Polynucleotides encoding these
 polypeptides are also encompassed by the invention.

This gene is expressed primarily in human fetal kidney, and to a lesser extent, in
 thymus and bone marrow cell line (RS4;11).

15 Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, developmental, metabolic, immune or hematopoietic disorders.
 Similarly, polypeptides and antibodies directed to these polypeptides are useful in
 20 providing immunological probes for differential identification of the tissue(s) or cell
 type(s). For a number of disorders of the above tissues or cells, particularly of the
 immune system, expression of this gene at significantly higher or lower levels may be
 routinely detected in certain tissues or cell types (e.g., developmental, metabolic,
 immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g.,
 25 lymph, serum, amniotic fluid, plasma, urine, synovial fluid and spinal fluid) or another
 tissue or cell sample taken from an individual having such a disorder, relative to the
 standard gene expression level, i.e., the expression level in healthy tissue or bodily
 fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
 30 NO:129 as residues: Thr-17 to Trp-26, Pro-54 to Trp-61, Ala-65 to Arg-74, Pro-142 to
 Leu-147, Pro-158 to Ala-165.

The tissue distribution in thymus and bone marrow cell lines indicates
 polynucleotides and polypeptides corresponding to this gene are useful for the
 diagnosis, treatment, and/or prevention of immune disorders involving stem cells.
 35 Moreover, polynucleotides and polypeptides corresponding to this gene are useful for
 the treatment and diagnosis of hematopoietic related disorders such as anemia,
 pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are

LERQRVDAGARLGHMGQPVAFSTRQLHLALPAPGTAGVTVPHPHAREGVV
GDLPLVPDAEDPTVGVPAEGLLVLGHVVERAELILVRGLHQAEALARESEEMH
GSRHG (SEQ ID NO:307), EGGLEQRVDAGARLGHMGQPVAFS (SEQ ID
NO:308), LALPAPGTAGVTVPHPHAREGVVGDPLV (SEQ ID NO:309), PAEG
5 LLVLGHVVERAELILVRGLHQAEA (SEQ ID NO:310), HLFKFFYTIAFMQWF
TEFMELFLSVWELIKTXNLFCVCFSEHKPGQLVPAGPTSQLLCRALGRVH
LCSPTTRSQTPTQSWVTPQLLWRLGSGRLVAQVLQVGSFCGPRVGDAVLGEQT
FQPFDLL (SEQ ID NO:311), AFMQWFTEFMELFLSVWELIKTXNLFCVC (SEQ
ID NO:312), and/or RSQTPTQSWVTPQLLWRLGSGRLVAQ (SEQ ID NO:313).

- 10 Polynucleotides encoding these polypeptides are also encompassed by the invention.
The gene encoding the disclosed cDNA is believed to reside on chromosome 16.
Accordingly, polynucleotides related to this invention are useful as a marker in linkage
analysis for chromosome 16.

- This gene is expressed primarily in human infant brain, and to a lesser extent, in
15 adult brain and lung.

- Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, neural, developmental, or pulmonary disorders. Similarly, polypeptides
20 and antibodies directed to these polypeptides are useful in providing immunological
probes for differential identification of the tissue(s) or cell type(s). For a number of
disorders of the above tissues or cells, particularly of the central nervous system
(CNS), expression of this gene at significantly higher or lower levels may be routinely
detected in certain tissues or cell types (e.g., neural, developmental, pulmonary, and
25 cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine,
amniotic fluid, synovial fluid and spinal fluid) or another tissue or cell sample taken
from an individual having such a disorder, relative to the standard gene expression
level, i.e., the expression level in healthy tissue or bodily fluid from an individual not
having the disorder.

- 30 Preferred epitopes include those comprising a sequence shown in SEQ ID
NO:130 as residues: Ser-47 to Pro-57, Ser-77 to Glu-82, Thr-90 to Trp-98, Arg-124 to
Lys-137, Ala-183 to Glu-192, Lys-220 to Gln-229, Asn-244 to Arg-258, Thr-271 to
Asn-278, Glu-285 to Gly-297.

- The tissue distribution in infant and adult brain indicates polynucleotides and
35 polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or
prevention of diseases of the CNS, such as mental retardation, schizophrenia,
Alzheimer's disease, paranoia, depression, and mania. Moreover, polynucleotides and

The gene encoding the disclosed cDNA is believed to reside on chromosome 17. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 17. In specific embodiments, polypeptides of the invention

5 comprise the following amino acid sequence:

GAWGVEVVAVGSKAGCLVYQLCDLKQITFFFRASVCLSV (SEQ ID NO:314),
 PASLGSSWGQKLRRGGTRKSFQELSPSSAPPACLPQPPASTWLSSWPRPPCW
 PPMCSWALGXCFPATGQWLPTSCCLWWCPDAGGRQKHFRSRWXTSWETW
 QPYLTGLISSVLRAXPDSYLQRFRLXQXXLCCAFVIALGGGCFLLTALYLER
 10 DETRAWQXVTGTPDSNDVDSNDLERQGLLSGXGASTEER (SEQ ID NO:315), L
 RGGTRKSFQELSPSSAPPACLPQPP (SEQ ID NO:316), ATGQWLPTSCCLW
 WCPDAGGRQKHFRSR (SEQ ID NO:317), GGCFLLTALYLERDETRAWQXV
 (SEQ ID NO:318), APHLRLQPACHSPLPLPGSRPGPDHPAGLLCVPGPWGX
 ASVLQLGSGCRHPAVCGGAQMPGDGRSTSDHGGXHPGXPGSPISQDLSLVSC
 15 GPXALTPICSASAAXXXXXXCAAPLSSPWGAAASC (SEQ ID NO:319),
 PACHSPLPLPGSRPGPDH PAGLLCV (SEQ ID NO:320), and/or
 SGRHPAVCGGAQMPGDGRSTSDHGG (SEQ ID NO:321). Polynucleotides
 encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in pineal gland and thymus.

20 Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, immune, endocrine, emotional or behavior disorders, in addition to
 autoimmune diseases. Similarly, polypeptides and antibodies directed to these
 25 polypeptides are useful in providing immunological probes for differential identification
 of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells,
 particularly of the immune system, expression of this gene at significantly higher or
 lower levels may be routinely detected in certain tissues or cell types (e.g., immune,
 endocrine, hematopoietic, neural, and cancerous and wounded tissues) or bodily fluids
 30 (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or
 cell sample taken from an individual having such a disorder, relative to the standard
 gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an
 individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
 35 NO:131 as residues: Asp-18 to Gln-27, Arg-44 to Asn-49.

The tissue distribution in thymus indicates polynucleotides and polypeptides
 corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of

This gene is expressed primarily in IL-1 and LPS induced neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly inflammation. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:132 as residues: Ser-45 to His-50, His-52 to Ile-57, Lys-67 to His-81.

The tissue distribution in neutrophils, combined with the detected ISRE biological activity indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of inflammatory disorders, such as psoriasis, inflammatory bowel disease, rheumatoid arthritis, and sepsis. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:18 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

and treatment of disorders and conditions afflicting the skeletal system, in particular osteoporosis, bone cancer, as well as, disorders afflicting connective tissues (e.g. arthritis, trauma, tendonitis, chondromalacia and inflammation), such as in the diagnosis or treatment of various autoimmune disorders such as rheumatoid arthritis, lupus, scleroderma, and dermatomyositis as well as dwarfism, spinal deformation, and specific joint abnormalities as well as chondrodysplasias (i.e. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). The protein product of this gene may also be useful for the detection, treatment, and/or prevention of a variety of vascular disorders which include, but are not limited to, atherosclerosis, embolism, stroke, microvascular disease, or aneurysm. The protein may also be useful in the treatment of integumentary disorders, particularly those related to aberrations in the extracellular matrix or lamina. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:19 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1219 of SEQ ID NO:19, b is an integer of 15 to 1233, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:19, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 10

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

XGDTXTQNSRHDTPLIDYYRESCTLQYRPEFPGRPTRPRGSCPQYPGPAIPRT
SWALGEGDAAPRGAHH PRRADVPLG (SEQ ID NO:331), YRESCTLQYRPEFPG
RPTRPRGSCPQYPGP (SEQ ID NO:332), GKLYAAVPSGIPGSTHASARLMPPVS
RSSYSEDIVGSRRRRRSSSGSPSPQSRCSSWDGCSRSHSRGREGXRPPWSEL
DVGALYPFSRSGSRGRLPRFRNYAFASSWSTSYSGYRYHRALLCRRTAVSGR
LREGREPSAEEAEGEREDWGIGSA (SEQ ID NO:333), SGIPGSTHASARLMPP

to 1090, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:20, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 11

When tested against NIH3T3 cell lines, supernatants removed from cells containing this gene activated the EGR1 (early growth response gene 1) promoter element. Thus, it is likely that this gene activates fibroblast cells, or more generally, other cells of the integumentary system, through the EGR1 signal transduction pathway. EGR1 is a separate signal transduction pathway from Jak-STAT. Genes containing the EGR1 promoter are induced in various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

LPFTLKPKMVKIPFSSRLINNNLQYIDCILSLKRCEEILLMWHGLLLCLASVFLE
LRGDRPPLLASLLEPHKMPLHSSSL (SEQ ID NO:340), LKPKMVKIPFSSRLIN
NNLQYIDC (SEQ ID NO:341), SLKRCEEILLMWHGLLLCLASVF (SEQ ID
NO:342), LRGDRPPLLASLLEPHKMPLH (SEQ ID NO:343), LQMHTGSGFKGK
SCEVAFYVAQAEKPGEGAYLHGAQETQKQGIEADHATLRGSPHSVSKTKYNLY
IANYLLAWRKMES (SEQ ID NO:344), CEVAFYVAQAEKPGEGAYLH (SEQ ID
NO:345), and/or ATLRGSPHSVSKTKYNLYIANY (SEQ ID NO:346).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in human ovarian cancer.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive disorders, particularly cancers, such as ovarian cancer.

Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the female reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the

LSASLLDRYPASESNNYIFNFVLYMLHFLAGTLFSLFPDFELSPRSATLFPDLR
 TVQLLSSRPHL (SEQ ID NO:347), LLDYPASESNNYIFNFVLYMLH (SEQ ID
 NO:348), FPDFELSPRSATLFPDLRTV (SEQ ID NO:349), NGGFYDVSKQAG
 LIEFLCIYFYFMAHVICGSRFTIVRTIPVHYVGEYFIKSSIWILYRINERTATKK
 5 AASDFQKNFRCFLDAF (SEQ ID NO:350), KQAGLIEFLCIYFYFMAH (SEQ ID
 NO:351), and/or YFIKSSIWILYRINERTATKKA (SEQ ID NO:352).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in anergic T-cells.

Therefore, polynucleotides and polypeptides of the invention are useful as
 10 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, immune or hematopoietic disorders, particularly immunodeficiencies and
 inflammatory disorders. Similarly, polypeptides and antibodies directed to these
 polypeptides are useful in providing immunological probes for differential identification
 15 of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells,
 particularly of the immune system, expression of this gene at significantly higher or
 lower levels may be routinely detected in certain tissues or cell types (e.g., immune,
 hematopoietic cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum,
 plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken
 20 from an individual having such a disorder, relative to the standard gene expression
 level, i.e., the expression level in healthy tissue or bodily fluid from an individual not
 having the disorder.

The tissue distribution in anergic T-cells, combined with the detected calcium
 flux biological activity, indicates polynucleotides and polypeptides corresponding to
 25 this gene are useful for the diagnosis and treatment of immune disorders, particularly
 those involving anergic T-cells. Moreover, the secreted protein can also be used to
 determine biological activity, to raise antibodies, as tissue markers, to isolate cognate
 ligands or receptors, to identify agents that modulate their interactions, and as
 nutritional supplements. It may also have a very wide range of biological activities.
 30 Typical of these are cytokine, cell proliferation/differentiation modulating activity or
 induction of other cytokines; immunostimulating/immunosuppressant activities (e.g. for
 treating human immunodeficiency virus infection, cancer, autoimmune diseases and
 allergy); regulation of hematopoiesis (e.g. for treating anaemia or as adjunct to
 chemotherapy); stimulation or growth of bone, cartilage, tendons, ligaments and/or
 35 nerves (e.g. for treating wounds, stimulation of follicle stimulating hormone (for
 control of fertility); chemotactic and chemokinetic activities (e.g. for treating infections,
 tumors); hemostatic or thrombolytic activity (e.g. for treating haemophilia, cardiac

expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in bone marrow tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of some types of leukemia, and other disorders involving bone marrow tissues or cells. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:23 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 551 of SEQ ID NO:23, b is an integer of 15 to 565, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:23, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 14

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: MKHAAFGLIPLVKEIYRYLKI KSKLLIGSGKCQLQPEWL QTSLINSSLLMDWLTPY (SEQ ID NO:354), IYRYLKI KSKLLIGSGKCQLQPE WLQTSL (SEQ ID NO:355), QLGLPWDQSKGPRKNGLSMCGSVYSTIWSLIA SRREETIRVIVLYIQSPNINTRHISKRGLN KALTNP (SEQ ID NO:356), SKGPR

to 1356, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:24, and where b is greater than or equal to a + 14.

5 FEATURES OF PROTEIN ENCODED BY GENE NO: 15

The translation product of this gene has homology to the conserved human non-differentiated blood cell tyrosine kinase receptor fragment (See Genbank Accession No. R76466) which is thought to be important in signalling essential cellular pathways. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: HPQTSAGGFPLHQGLPTVS (SEQ ID NO:359), PSWFPELSPWPLKTL KKRRQMRLRRRGRLCRLSPATTTTADTCRCPARSYRGSGRRPACAQDSPAPPS RPTRRAWEKALRPKRAAQWSTGVPPSPRSSTTGCCFGTAAXCAEGARR (SEQ ID NO:360), TTTADTCRCPARSYRGSGRRPA (SEQ ID NO:361), and/or PSRPTRRAWEKALRPKRAAQWST (SEQ ID NO:362). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in human fetal epithelium.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, developmental, integumentary, immune, or hematopoietic disorders, particularly skin cancer. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the integumental system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., developmental, integumentary, immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:139 as residues: Gln-26 to Ala-39, Cys-48 to His-55.

The tissue distribution in human fetal epithelium, combined with the homology to a conserved tyrosine kinase receptor, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of skin cancer, or other disorders related to the integument, particularly proliferative

When tested against PC12 cell lines, supernatants removed from cells containing this gene activated the EGR1 (early growth response gene 1) pathway. Thus, it is likely that this gene activates sensory neuron cells, or generally other cells or cell types, particularly immune cells, through the EGR1 signal transduction pathway. EGR1 is a separate signal transduction pathway from Jak-STAT, genes containing the EGR1 promoter are induced in various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

ARGVLNLRNRFECFSIIETV (SEQ ID NO:363), IGQLVMKSICHFQRLLSVAI

DFASQFLKNYIFSSTHSSKAGFSVVCSPKWL YTDGMEMVLKITHKLSF (SEQ ID NO:364), and/or QRLLSVAIDFASQFLKNYIFSSTH (SEQ ID NO:365).

Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 8. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 8.

This gene is expressed primarily in fetal liver, and to a lesser extent, in resting T-cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune, hematopoietic, or hepatic disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, hepatic, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, amniotic fluid, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in fetal liver and resting T-cells, combined with the detected EGR1 biological activity indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of immune disorders involving T-cells, and more generally, hematopoietic conditions. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia,

biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly in immune system maturation and hematopoietic development. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:141 as residues: Ile-46 to Tyr-56.

The tissue distribution in CD34-positive T cells and anergic T cells. indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of diseases involving hematopoietic development and stem cell maturation, including protection of stem cells from chemotherapy, immunosuppression during transplant rejection, and neutropenia. Moreover, this gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic cancerous and wounded
5 tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
10 NO:142 as residues: Val-25 to Gly-33.

The tissue distribution in activated neutrophils, combined with the detected GAS biological activity, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of immune disorders involving neutrophils. Moreover, this gene product may be involved in the regulation of
15 cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS,
20 leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus
25 erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or
30 immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:28 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the
35 scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of

processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:29 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 814 of SEQ ID NO:29, b is an integer of 15 to 828, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:29, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 20

This gene is expressed primarily in 7 week old early stage human.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, fetal or developmental abnormalities, particularly congenital defects, including metabolic conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells,

PA (SEQ ID NO:378), GRDSEDGKGREGMGRDRKGWDGTGLD (SEQ ID NO:379), TSLGDLWDYNNSSH (SEQ ID NO:380), DRRIIRTREAAVAVSRERP LHSSLGNRERLRRWEGTGRDGKGQEGMGRDGTGWDGMGREERKKCPS (SEQ ID NO:381), RPLHSSLGNRERLRRWEGTGRDGKG (SEQ ID NO:382),
5 NQSWGPMGL (SEQ ID NO:383), GGGGCSEPRTSIALQPGKQGETPKMGRD KKGWEGTGRDGTGRDWMGRDGKGREKEMSQQ (SEQ ID NO:384), KQGE TPKMGRDGKGWEGTGRDGTG (SEQ ID NO:385), and/or PVLGTYGTITTPV TELTKGQEKEGGVETVLYE (SEQ ID NO:386). Polynucleotides encoding these polypeptides are also encompassed by the invention.

10 This gene is expressed primarily in frontal cortex from a patient suffering from schizophrenia.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
15 not limited to, neural disorders, such as Schizophrenia. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain
20 tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

25 The tissue distribution in frontal cortex tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of some central nervous system disorders, for example, schizophrenia. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioural disorders, or
30 inflammatory conditions such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning
35 disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural

tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:146 as residues: Lys-38 to Leu-46.

The tissue distribution in thymus and neutrophils indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of inflammatory disorders, such as psoriasis, inflammatory bowel disease, rheumatoid arthritis, and sepsis. Moreover, the expression of this gene product indicates a role in regulating the proliferation; survival; differentiation; and/or activation of hematopoietic cell lineages, including blood stem cells. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:32 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 870 of SEQ ID NO:32, b is an integer of 15 to

expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

- 5 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:33 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.
- 10 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 852 of SEQ ID NO:33, b is an integer of 15 to 866, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:33, and where b is greater than or equal to a + 14.

15

FEATURES OF PROTEIN ENCODED BY GENE NO: 24

This gene is expressed primarily in Merkel cells.

- 20 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, integumentary disorders, particularly aberrations in mechanosensory function. Similarly, polypeptides and antibodies directed to these polypeptides are
- 25 useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly in tissues involved in sensory function, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., integumentary, sensory, and cancerous and wounded tissues) or bodily fluids (e.g.,
- 30 lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

- 35 The tissue distribution in Merkel cells indicates polynucleotides and polypeptides corresponding to this gene are useful for Merkel cell dysfunctions, which may include aberrations in sensory function. Alternatively, polynucleotides and polypeptides corresponding to this gene are useful for the treatment, diagnosis, and/or

polypeptides of the invention comprise the following amino acid sequence:
GTSFSVLSLIHDTG (SEQ ID NO:392). Polynucleotides encoding these polypeptides
are also encompassed by the invention. The gene encoding the disclosed cDNA is
believed to reside on chromosome 11. Accordingly, polynucleotides related to this
5 invention are useful as a marker in linkage analysis for chromosome 11.

This gene is expressed primarily in kidney cortex and muscle tissue from a
patient with multiple sclerosis, and to a lesser extent, in fetal liver/spleen.

Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
10 biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, muscle, urogenital, or renal disorders, particularly musculodegenerative
conditions such as multiple sclerosis, in addition to kidney or metabolic disorders and
diseases. Similarly, polypeptides and antibodies directed to these polypeptides are
useful in providing immunological probes for differential identification of the tissue(s)
15 or cell type(s). For a number of disorders of the above tissues or cells, particularly of
the multiple sclerosis and renal system, expression of this gene at significantly higher or
lower levels may be routinely detected in certain tissues or cell types (e.g., muscle,
urogenital, renal, hepatic, metabolic, immune, hematopoietic, and cancerous and
wounded tissues) or bodily fluids (e.g., lymph, serum, bile, amniotic fluid, plasma,
20 urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an
individual having such a disorder, relative to the standard gene expression level, i.e.,
the expression level in healthy tissue or bodily fluid from an individual not having the
disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
25 NO:149 as residues: Ala-66 to Leu-73.

The tissue distribution in kidney cortex and muscle tissue, combined with the
homology to small molecule transporters indicates polynucleotides and polypeptides
corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
disorders of renal functions and muscular diseases, including multiple sclerosis,
30 muscular dystrophy, cardiomyopathy, fibroids, myomas, and rhabdomyosarcomas.
The tissue distribution in kidney indicates that this gene or gene product could be used
in the treatment and/or detection of kidney diseases including renal failure, nephritis,
renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis,
nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and
35 kidney stones, in addition to Wilm's Tumor Disease, and congenital kidney
abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome.
Protein, as well as, antibodies directed against the protein may show utility as a tumor

NO:394), and/or GEPKTPEKSKCSLKQCFSSCNVHIDHL (SEQ ID NO:395).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in kidney medulla.

Therefore, polynucleotides and polypeptides of the invention are useful as
5 reagents for differential identification of the tissue(s) or cell type(s) present in a
biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, renal, urogenital, or more generally, disorders afflicting endothelial
tissues. Similarly, polypeptides and antibodies directed to these polypeptides are useful
in providing immunological probes for differential identification of the tissue(s) or cell
10 type(s). For a number of disorders of the above tissues or cells, particularly of the renal
system, expression of this gene at significantly higher or lower levels may be routinely
detected in certain tissues or cell types (e.g., renal, urogenital, endothelial, and
cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine,
synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual
15 having such a disorder, relative to the standard gene expression level, i.e., the
expression level in healthy tissue or bodily fluid from an individual not having the
disorder.

The tissue distribution in kidney medulla indicates polynucleotides and
polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or
20 prevention of renal disorders, including lesions, vascular diseases, hydronephrosis,
and renal diseases associated with systemic disorders. Moreover, the gene or gene
product could be used in the treatment and/or detection of kidney diseases including
renal failure, nephritis, renal tubular acidosis, proteinuria, pyuria, edema,
pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome,
25 glomerulonephritis, hematuria, renal colic and kidney stones, in addition to Wilm's
Tumor Disease, and congenital kidney abnormalities such as horseshoe kidney,
polycystic kidney, and Falconi's syndrome. The protein product can also be used for
the treatment, detection, and/or prevention of various endothelial disorders, which
include microvascular disease, embolism, aneurysm, stroke, or atherosclerosis.
30 Protein, as well as, antibodies directed against the protein may show utility as a tumor
marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available
and accessible through sequence databases. Some of these sequences are related to SEQ
ID NO:36 and may have been publicly available prior to conception of the present
35 invention. Preferably, such related polynucleotides are specifically excluded from the
scope of the present invention. To list every related sequence is cumbersome.
Accordingly, preferably excluded from the present invention are one or more

level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in fetal lung indicates polynucleotides and polypeptides corresponding to this gene are useful for diagnosis and intervention of diseases related to pulmonary functions and infections. Moreover, the expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:37 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1160 of SEQ ID NO:37, b is an integer of 15 to 1174, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:37, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 28

This gene is expressed primarily in hepatocellular tumors.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, metabolic or hepatic disorders or diseases, particularly hepatocellular tumors. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the liver, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., metabolic, hepatic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, bile, plasma, urine, synovial fluid and

This gene is expressed primarily in normal breast.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, or endocrine disorders, particularly of the breast, such as breast cancer. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the cancer and metabolic systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, endocrine, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, breast milk, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in breast indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of some types of breast cancer. The protein can also be used for the treatment, detection, and/or prevention of disorders related to ductile tissues or cell types, particularly secretory dysfunctions. The protein can also be used for the treatment of vascular disorders such as atherosclerosis, microvascular disease, embolism, stroke, or aneurysm. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:39 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 424 of SEQ ID NO:39, b is an integer of 15 to 438, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:39, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 30

contraceptive. The protein can also be used for the maintenance normal testicular function. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:40 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 720 of SEQ ID NO:40, b is an integer of 15 to 734, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:40, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 31

This gene is expressed primarily in colon, and to a lesser extent, in thymus.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, gastrointestinal, immune, or hematopoietic disorders, particularly abnormalities of the colon, and cancers. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the digestive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., gastrointestinal, immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in colon and thymus tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of abnormalities of the colon. The protein can also be used for treating inflammatory conditions, or potentially in modulating immune system activation in the treatment of gastrointestinal disorders. Protein, as well as, antibodies directed against

useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the muscular system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., muscle, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:156 as residues: Gly-28 to Asp-33.

The tissue distribution in rhabdomyosarcoma tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of rhabdomyosarcoma. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection, treatment, and/or prevention of various muscle disorders, such as muscular dystrophy, cardiomyopathy, fibroids, or myomas. The protein can also be used for the amelioration of proliferative conditions in other tissues, including modulation of the immune response to such tissues. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:42 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 984 of SEQ ID NO:42, b is an integer of 15 to 998, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:42, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 33

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: NSAEQSMILVT (SEQ ID NO:421), RXDRXPVPELPGYEPT RTDISSFKNYRYAFDFARDKDQRSIDDTAKSMLALLLGRTWPLFSVFYQYLE QSKYRVMNKDQWYNVLEFSRTVHADLSNYDEDGAWPVLLDEFVEWQKVRQT

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 644 of SEQ ID NO:43, b is an integer of 15 to 658, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:43, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 34

Polypeptides of the invention do not comprise the polypeptide sequence shown as Genbank Accession W59652, which is hereby incorporated herein by reference. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: LFRCPIGKAGTPAGXGPEFPGRPTRPVREKELTETFE (SEQ ID NO:430), FFVFPYPYPFRPLPPIPFPRFPWFRRNFPIPIPESAPTTPLPSEK (SEQ ID NO:432), PWFRRNFPIPIPESAPTTPLP (SEQ ID NO:433), and/or GKAGTPAGXGPEFPGRPTRPV (SEQ ID NO:431). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in Hodgkin's lymphoma.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly Hodgkin's lymphoma. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:158 as residues: Ser-21 to Asp-35, Pro-47 to Pro-52, Pro-62 to Asn-67.

The tissue distribution in Hodgkin's lymphoma tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of Hodgkin's lymphoma. Moreover, polynucleotides and

large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. The translation product of this gene was shown to have

5 homology to a conserved trypsin inhibitor which is thought to play an essential role in protein metabolism and regulation (See Genbank Accession No. pirlS35098|S35098). In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

FYPMTQGKESLPLLALQIFNTTFRPSFAFFSGHRTLFFGVRSNPCKPRIFLIW
10 LIAVAL (SEQ ID NO:434), LLALQIFNTTFRPSFAFFSGHRTLFFGVRSNP (SEQ ID NO:435), HLAQTVMMHPQKSFYQVKNTNHSRGAIEETQILEDRLGQIPLCLES QIWEA (SEQ ID NO:436), KNTNHSRGAIEET QILEDRLGQIPLCL (SEQ ID NO:437), QGCYRRDS NIGRQVRPDSIMLRKPD LGSITHYGSVLGNLNYCDLP QLYRNPSLGNSGMREMFSPFYNPVECHP (SEQ ID NO:438), PDSIMLRKPD
15 LGSITHYGSVLGN (SEQ ID NO:439), and/or YRNPSLGNSGMREMFSPFYNPV (SEQ ID NO:440). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in brain frontal cortex.

Therefore, polynucleotides and polypeptides of the invention are useful as

20 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural disorders, particularly disorders of the central nervous system or endocrine system. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the

25 tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system or endocrine system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample

30 taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in brain frontal cortex, combined with the detected GAS and ISRE biological activities indicates polynucleotides and polypeptides corresponding

35 to this gene are useful for diagnosis or treatment of disorders of the central nervous system, caused by trauma, inflammation, demyelination, neoplasia, and degenerative diseases. Additionally, the molecule may function as a neuropeptide or hormone.

NO:442), LGILLLLGIYTNHIWEMFLAA (SEQ ID NO:443), KSVKRQINFPSSKDV
GCSLEVPKDGPP (SEQ ID NO:444), GKEWIPLSHRKGWIPLSHMKGWPSLSH
(SEQ ID NO:445), GWASTQPRERMDPAQPQERMDPSQPHERMALTQPWKMAP
TQPSCRI (SEQ ID NO:446), and/or PAQPQERMDPSQPHERMALTQPWK (SEQ ID
5 NO:447). Polynucleotides encoding these polypeptides are also encompassed by the
invention.

This gene is expressed primarily in neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
10 biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, immune or hematopoietic disorders. Similarly, polypeptides and
antibodies directed to these polypeptides are useful in providing immunological probes
for differential identification of the tissue(s) or cell type(s). For a number of disorders
of the above tissues or cells, particularly of the immune system, expression of this gene
15 at significantly higher or lower levels may be routinely detected in certain tissues or cell
types (e.g., immune, hematopoietic cancerous and wounded tissues) or bodily fluids
(e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or
cell sample taken from an individual having such a disorder, relative to the standard
gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an
20 individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
NO:160 as residues: Ser-30 to Asp-39.

The tissue distribution in neutrophils indicates polynucleotides and polypeptides
corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
25 immune disorders involving neutrophils, including neutropenia. The expression of this
gene product indicates a role in regulating the proliferation; survival; differentiation;
and/or activation of hematopoietic cell lineages, including blood stem cells. This gene
product may be involved in the regulation of cytokine production, antigen presentation,
or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by
30 boosting immune responses). Since the gene is expressed in cells of lymphoid origin,
the natural gene product may be involved in immune functions. Therefore it may be also
used as an agent for immunological disorders including arthritis, asthma,
immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis,
granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia,
35 neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune
reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-
host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue

many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and

5 differentiation of cells. The protein product of this gene was found to have homology to the G-protein coupled receptor TM1 long consensus polypeptide (See Genbank Accession No. R50790) which indicates the protein is useful in the modulation of signalling events, cell-cycle regulation and/or transcriptional regulation. In specific embodiments, polypeptides of the invention comprise the following amino acid
10 sequence: IANGGGRPIKLNALYK IQNECKIVFTCIDF (SEQ ID NO:448), and/or MPCIK SKMNAKLFSVLTLCCMIPISVLFGTCI (SEQ ID NO:449).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

The gene encoding the disclosed cDNA is believed to reside on chromosome 1.

Accordingly, polynucleotides related to this invention are useful as a marker in linkage
15 analysis for chromosome 1.

This gene is expressed primarily in duodenum.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
20 not limited to, gastrointestinal disorders, particularly abnormalities of the duodenum. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the digestive system, expression of this gene at significantly higher or lower levels may be
25 routinely detected in certain tissues or cell types (e.g., gastrointestinal, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

30 The tissue distribution in duodenum, the homology to the TM1 g-protein coupled receptor consensus sequence, in addition to the detected GAS and ISRE biological activities, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of the abnormalities of the duodenum, particularly proliferative conditions such as cancers. Moreover, the
35 protein can be used in G-protein coupled receptor ligand binding assays. The assay can be used to identify fragments from GPR proteins (see Genseq Accession Nos. R48686-R48758 for examples) which retain biological activity such as binding a GPR ligand or

This gene is expressed primarily in ovary.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, or endocrine disorders, particularly abnormalities of the ovary. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, endocrine, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:162 as residues: Lys-25 to Thr-33, Leu-39 to Glu-47.

The tissue distribution in ovary, combined with the homology to the growth and transformation dependent protein, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of the abnormalities of the ovary such as ovarian cancer. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:48 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 723 of SEQ ID NO:48, b is an integer of 15 to 737, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:48, and where b is greater than or equal to a + 14.

scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 557 of SEQ ID NO:49, b is an integer of 15 to 571, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:49, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 40

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: PRVRKTPHLSASGK (SEQ ID NO:469), YYYSMLKICHITI LETLSDRTPRKFAK KCYILYIKLSDSSVEKVAYTLLLLIPAAIEKK (SEQ ID NO:470), and/or TILETLSDRTPRKFAK KCYILYIKLSDSSVEK (SEQ ID NO:471).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in endometrial stromal cells treated with estradiol.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive disorders, particularly cancer of the endometrium. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, endometrial, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:164 as residues: Met-1 to Ser-7.

The tissue distribution in endometrial stromal cells indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of diseases of the endometrium, particularly cancer or diseases caused by hormonal imbalances. Protein, as well as, antibodies directed against the protein may

fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:165 as residues: Pro-30 to Lys-38, Pro-45 to Ile-60, Leu-79 to Ser-96, His-98 to Gly-118.

The tissue distribution in bladder tumors indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis of carcinomas and preneoplastic or pathological conditions of bladder, or of the urogenital/renal system.

Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:51 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 899 of SEQ ID NO:51, b is an integer of 15 to 913, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:51, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 42

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: RIPLQSDGSFLHEKSSQQRNRFPCPTLQCNPEVSFWFV VTDPSKNHTLPAVEVQSAIRMNKNRINNAFFLNDQTLEFLKIPSTLAPPM DPS VPIWIIIFGVIFCIIIVAIALLLSGIWQRRRKNKEPSEVDDAEDKCENMITIENGIP SDPLDMKG GHINDAFMTEDERLTPL (SEQ ID NO:477), PCPTLQCNPEVSF W FVVTDP SKNHT (SEQ ID NO:478), AIRMKNRINNAFFLNDQTLEFL (SEQ ID NO:479), IWQRRRKNKEPSEVDDAEDKCENM (SEQ ID NO:480), PLDMKG GHINDAFMTEDER (SEQ ID NO:481), GSRTTALQRGVSLSSSVMKASLICPP FMSRGSEGMPFSIVIMFSLSSASSTSDGSLFFLLRCQIPDKISSAIATMM MQNITPNIIQMGTDGSMGGASVEGIFKNSRVWSFRKKALLIRFLFILMADCTST A GRV (SEQ ID NO:482), VSLSSSVMKASLICPPFMSRGSEGMPFS (SEQ ID

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1342 of SEQ ID NO:52, b is an integer of 15 to 1356, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:52, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 43

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: GARGSQQDAPALQEA EVRGP ERAQPARGR (SEQ ID NO:485), SERPGEGPARPGQDDQGPA VPAVAGAGVGVHDPADHRVLGQRSAA HFYLHTSFSRPHTGPPLPTPGPDRTGSSRPTPMSTSFWTISHAGVKQSDLPRKE TEQPPAPGEHGGGERERLRLVPARRPAQPRPGPAAGGAEERAAGLLRQLQP GLPHQGARIRRH PQLGAEPDRGRPARGHLLRAQGG LHQLEARD DRAER KPAAPRCALPRPAAH PARARAQRQRAPDLQQVLAPLREALPPPHEGQAQEVHQ VPLRARPLRAPDLRLPQQVRAGERGVLPQVRRRAHAAGVRQPHQPARLGAR GLPRWPQGVLRLHPVPAGPAHGEAGALQRALAAGVPPLPPVPDRLRFLG KLETLD EDA AQLLQLLQVDRQSASPRATGTGPPAAGRRTGSPRSPWPGG SSCINSTRPTLFSSATPSPKTSSETESFRVAFSRVPGT (SEQ ID NO:486), RPGQ DDQGPA VPAVAGAGVGVHDP A (SEQ ID NO:487), SRPHTGPPLPTPGPDRT GSSR (SEQ ID NO:488), SHAGVKQSDLPRKETEQPPAPGE (SEQ ID NO:489), RRPAQPRPGPAAGGAEERAAGLL (SEQ ID NO:490), RRHPQLGAEPDRGR PARGHLL (SEQ ID NO:491), RDDRAERKPAAPRCALPRPAAH PAR (SEQ ID NO:492), RAPDLQQVLAPLREALPPPHEGQAQEV (SEQ ID NO:493), DLRLPQQ VRAGERGVLPQVRRRAHAAG (SEQ ID NO:494), QPARLGARGLPRWPQGVLRL HPVPAG (SEQ ID NO:495), AGVPPLPPVPDRLRFLGKLETLD E (SEQ ID NO:496), QLLQLLQVDRQSASPRATGTGPPAA (SEQ ID NO:497), NSTRPTLFSS ATPSPKTSSETESFR (SEQ ID NO:498), LGGKRTAGPPGVAAAAARRPRPE SPASPGIVVDLARVAEAVHLPPVLVEGRQLLRVRVQQVLDEVGEGHLEASA EGLARRGGQAGVVG VHPQHGHGELAVELLVLQLELAAEGGDQAHEGVAHEE ELGVLL ELDLHEVAGELPVAAPELVEGQVRAGVVHVLARDAQRVAVGRTA VQQA SAQH DHHALPVGAGHLGHVAVDGPVPVVDQVAQLRVGDVVECALLG GEGQAGVGAEAPQHVPPLRLLPALVWAAPGVARGPVVASHALLHAPPA QAAAPSPFWEGHSASRQHEKLSRNSSTSESAVSS LSCPARAWAAAAPCAA (SEQ ID NO:499), EAVHLPPVLVEGRQLLRVRVQQV (SEQ ID NO:500), GHLEA SAEGLARRGGQAGVVG VHP (SEQ ID NO:501), QLELAAEGGDQAHEGVAHE

as leukemia. Moreover, the protein product of this clone is useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:53 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence would be cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1533 of SEQ ID NO:53, b is an integer of 15 to 1547, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:53, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 44

When tested against fibroblast cell lines, supernatants removed from cells containing this gene activated the EGR1 (early growth response gene 1) promoter element. Thus, it is likely that this gene activates fibroblasts, or more generally, other cells or cell types, through the EGR1 signal transduction pathway. EGR1 is a separate signal transduction pathway from Jak-STAT, genes containing the EGR1 promoter are induced in various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. The gene encoding the disclosed cDNA is believed to reside on chromosome 12. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 12. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: STGCSE (SEQ ID NO:515),

corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Alternatively, the expression within fetal kidney indicates the protein product of this gene could be used in the treatment and/or detection of kidney diseases including renal failure, nephritis, renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and kidney stones, in addition to Wilm's Tumor Disease, and congenital kidney abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome. Moreover, the expression within various fetal tissues, combined with the detected EGR1 biological activity, indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:54 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1324 of SEQ ID NO:54, b is an integer of 15 to 1338, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:54, and where b is greater than or equal to a + 14.

learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The protein may also be useful in the treatment, detection, and/or prevention of liver disorders, which include, but are not limited to hepatoblastoma, jaundice, hepatitis, liver metabolic diseases and conditions that are attributable to the differentiation of hepatocyte progenitor cells. In addition the expression in fetus would suggest a useful role for the protein product in developmental abnormalities, fetal deficiencies, pre-natal disorders and various wound-healing models and/or tissue trauma. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:55 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 2057 of SEQ ID NO:55, b is an integer of 15 to 2071, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:55, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 46

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: YIYSYLGFFNQINK (SEQ ID NO:525). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed in only T-cell helper II cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly infectious diseases, inflammatory, or immunodeficiency conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1885 of SEQ ID NO:56, b is an integer of 15 to 1899, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:56, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 47

The translation product of this gene has been shown to have homology to the human nuclear factor IV (See Genbank Accession No. gil35038), which is thought to play a role as a type 2 DNA helicase in DNA metabolism either during transcription, DNA repair, and/or during the cell-cycle. Moreover, the protein may play a role in chromosomal translocations. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ARDLIL (SEQ ID NO:526), LTFYL QFLAPKDKPSGDTAAVFEEGGDVDDLSTFNMHLVFCD (SEQ ID NO:527), and/or FLAPKDKPSGDTAAVFEEGGDVDDL (SEQ ID NO:528). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 2. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 2.

This gene is expressed primarily in activate T-cells, and to a lesser extent, in B-cells and monocytes.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly leukemia, Grave's disease, rheumatoid arthritis and other autoimmune diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

FEATURES OF PROTEIN ENCODED BY GENE NO: 48

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ARAGAKILFEGEF (SEQ ID NO:529), NFEIHSAPPFMLFVA
 5 CLLHSSCPRTARFLASPLSESNVIFYQNQYQFPCILCFIEFARLTSFKHLIHSQSH
 LVRLQYEDFSVSSE AWDTELT (SEQ ID NO:530), FPFMLFVACLLHSSCPRTA
 RFLASPL (SEQ ID NO:531), NVIFYQNQYQFPCILCFIEFARLTSF (SEQ ID
 NO:532), and/or SQSHLVRLQYEDFSVSSE AWDTE (SEQ ID NO:533).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

- 10 The gene encoding the disclosed cDNA is believed to reside on chromosome 14.
 Accordingly, polynucleotides related to this invention are useful as a marker in linkage
 analysis for chromosome 14.

This gene is expressed primarily in fetal tissues such as fetal liver, fetal brain,
 fetal lung and fetal spleen.

- 15 Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, developmental disorders and cancers. Similarly, polypeptides and
 antibodies directed to these polypeptides are useful in providing immunological probes
 20 for differential identification of the tissue(s) or cell type(s). For a number of disorders
 of the above tissues or cells, particularly of the immune system and nervous system,
 expression of this gene at significantly higher or lower levels may be routinely detected
 in certain tissues or cell types (e.g., developmental, hepatic, immune, hemaopoietic,
 neural, pulmonary, and cancerous and wounded tissues) or bodily fluids (e.g., serum,
 25 plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell
 sample taken from an individual having such a disorder, relative to the standard gene
 expression level, i.e., the expression level in healthy tissue or bodily fluid from an
 individual not having the disorder.

- Preferred epitopes include those comprising a sequence shown in SEQ ID
 30 NO:172 as residues: Gly-37 to Asp-46, Ser-48 to Val-54.

- The tissue distribution in fetal tissues indicates polynucleotides and polypeptides
 corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
 developmental disorders and cancers. Moreover, the expression within embryonic
 tissue and other cellular sources marked by proliferating cells indicates that this protein
 35 may play a role in the regulation of cellular division, and may show utility in the
 diagnosis and treatment of cancer and other proliferative disorders. The protein is also
 useful in the treatment, detection, and/or prevention of immune, hematopoietic,

GDRGVLGSESRCRPDSEGCRWAT (SEQ ID NO:542), and/or SPGPGGDRGV LGSESRCRPD (SEQ ID NO:543). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in hematopoiesis cells such as neutrophils, eosinophils and T cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, blood diseases and/or immune diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the hematopoietic and immune systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:173 as residues: Ser-44 to Ala-63, Pro-89 to Gly-98, Pro-129 to Trp-137.

The tissue distribution in neutrophils, eosinophils, and T cells indicates polynucleotides and polypeptides corresponding to this gene are useful for treating and diagnosis blood related diseases. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. The homology to a pulmonary surfactant protein indicates that the protein is useful in enhancing or inhibiting the efficacy of the immune response across mucosal barriers, such as within the gastrointestinal tract, the sinuses, and the lungs. Protein, as well as, antibodies directed against the protein may

polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely
5 detected in certain tissues or cell types (e.g., neural, cardiovascular, developmental, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, amniotic fluid, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an
10 individual not having the disorder.

The tissue distribution in tissues of the CNS and infant brain, combined with the detected GAS biological activity indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment, diagnosis, and/or prevention of CNS disorders. Moreover, polynucleotides and polypeptides corresponding to this
15 gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction,
20 aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene
25 product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or
30 apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available
35 and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:60 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the

liver/spleen indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include

5 bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors

10 of various blood lineages, and in the differentiation and/or proliferation of various cell types. The protein may also be useful for the treatment and/or detection of metabolic disorders, which include Tay-Sachs disease, phenylketonuria, galactosemia, hyperlipidemias, porphyrias, and Hurler's syndrome. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy

15 targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:61 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the

20 scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1691 of SEQ ID NO:61, b is an integer of 15 to 1705, where both a and b correspond to the positions of nucleotide residues shown

25 in SEQ ID NO:61, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 52

30 When tested against U937 and fibroblast cell lines, supernatants removed from cells containing this gene activated both the GAS (gamma activating sequence) and EGR1 (early growth response gene 1) promoter elements. Thus, it is likely that this gene activates promyeloid cells, fibroblasts, or more generally, immune or integumentary cells or cell-types, through the JAK-STAT and/or EGR1 signal

35 transduction pathway. GAS is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells.

again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:62 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1017 of SEQ ID NO:62, b is an integer of 15 to 1031, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:62, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 53

Contact of cells with supernatant expressing the product of this gene has been shown to increase the permeability of the plasma membrane of HUVEC cells to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product binds a receptor on the surface of the plasma membrane of both vascular endothelial cells, in addition to other cell-lines or tissue cell types. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating endothelial cells, or more generally, neural or immune cells. Binding of a ligand to a receptor is known to alter intracellular levels of small molecules, such as calcium, potassium and sodium, as well as alter pH and membrane potential. Alterations in small molecule concentration can be measured to identify supernatants which bind to receptors of a particular cell. This protein is homologous to members of the butyrophilin gene family which are thought to play a role in myelin sheath development, in addition to serving as a membrane-specific receptor for cytoplasmic vesicles to the apical plasma membrane. In specific embodiments, polypeptides of the invention comprise the sequence

SAQFSVLGPSGPILAMVGEDADLPCHLFPTMSAETMELKW (SEQ ID NO:574).

Polynucleotides encoding these polypeptides are also encompassed by the invention. In

specific embodiments, polypeptides of the invention comprise the sequence

TPCSAQFSVLGPSGPILAMVGEDADLPCHLFPTMSAET (SEQ ID NO:548),

MELKWVSSSLRQVVNVYADGKEVEDRQSAPYRGRTSILRDGITAGKAALRIHN

of the above tissues or cells, particularly of the immune system expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., muscle, immune, neural, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:177 as residues: Ala-78 to Arg-94.

The tissue distribution in rhabdomyosarcoma, the detected calcium flux biological activity, combined with the homology to the butyrophilin gene family indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis or treatment of muscle disorders, which include, but are not limited to, muscular dystrophy, cardiomyopathy, fibroids, myomas, and/or rhabdomyosarcomas. Moreover, the homology to the butyrophilin protein indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The protein may also show utility in the correction or amelioration of myelin sheath deficiencies in developing and mature neurons and neural-cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:63 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

other endocrine-related disorders. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, 5 Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in 10 feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The protein product may also be useful in the treatment, detection, and/or 15 prevention of a variety of reproductive disorders which include, but are not limited to, the treatment of male infertility, and/or could be used as a male contraceptive. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available 20 and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:64 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more 25 polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1074 of SEQ ID NO:64, b is an integer of 15 to 1088, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:64, and where b is greater than or equal to a + 14.

30 FEATURES OF PROTEIN ENCODED BY GENE NO: 55

The translation product of this gene was found to have homology to the conserved R166.2 protein from *Caenorhabditis elegans* (See Genbank Accession 35 No.gil949849), which is thought to play an important role in the regulation of cellular function and processes. In specific embodiments, polypeptides of the invention comprise the sequence: LSFKDKSTYIESSTKVYDDMAFRYLSWILFPLLG (SEQ ID

useful for the detection, treatment, and/or prevention of a variety of vascular disorders, which include, but are not limited to the following: embolism, atherosclerosis, microvascular disease, aneurysm, stroke, and vascular leak syndrome. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:65 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1242 of SEQ ID NO:65, b is an integer of 15 to 1256, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:65, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 56

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: LGEFLSSQCFLP (SEQ ID NO:591). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in brain frontal cortex.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural disorders, particularly neurological or neurodegenerative disorders and diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the brain, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

RSRRNRVAMGMWASLDALWE (SEQ ID NO:592), PRVRCQQRAEGGMGAG
IGVGPSERTDIAVTPRGRSE GASVGVAPVHAEGAGGTGWPWGCGHRWTLCG
RCR PRSVSSGPCCSFPGQCIFGRPS (SEQ ID NO:593), GGMGAGIGVGPSER
TDIAVTPRGR (SEQ ID NO:594), GCGHRWTLGRCR PRSVSSGPCCSFP (SEQ
ID NO:595), and/or KKHGF NQQT LGFTWKYNKNKNLV (SEQ ID NO:596).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

The gene encoding the disclosed cDNA is believed to reside on chromosome 1.

Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 1.

This gene is expressed primarily in synovial cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, skeletal afflictions, particularly rheumatoid arthritis or autoimmune conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., skeletal, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:181 as residues: Gln-27 to Val-39, Glu-50 to Arg-56.

The restricted tissue distribution in synovium, combined with the detected GAS biological activity, indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of rheumatoid arthritis since synovial fibroblasts are associated with the synovium and cartilage. Moreover, polynucleotides and polypeptides corresponding to this gene are useful in the detection and treatment of disorders and conditions afflicting the skeletal system, in particular osteoporosis, bone

LVIPPVTDRK (SEQ ID NO:598), WGFTWIVGLGMSPSTALWTECTCTPFLVL
LSH (SEQ ID NO:599), VAVGVCREDVMGITDRSKMSPDVGIWAIYWSAAGY
WPLIGFPGTPTQQEPALHRVGVYLDRTGNVSFYSAVDGVHLHTFSCS
SVSRLRPFFLVESISIFSHSTSD (SEQ ID NO:600), ITDRSKMSPDVGIWAIYW
5 SAAGYWPLI (SEQ ID NO:601), and/or RGTGNVSFYSAVDGVHLHTFSCSSV
SRLRP (SEQ ID NO:602). Polynucleotides encoding these polypeptides are also
encompassed by the invention. The gene encoding the disclosed cDNA is believed to
reside on chromosome 7. Accordingly, polynucleotides related to this invention are
useful as a marker in linkage analysis for chromosome 7.

10 This gene is expressed primarily in fetal tissues, and to a lesser extent, in liver
cells.

Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
biological sample and for diagnosis of diseases and conditions which include, but are
15 not limited to, developmental or liver diseases, such as hepatocellular carcinoma.
Similarly, polypeptides and antibodies directed to these polypeptides are useful in
providing immunological probes for differential identification of the tissue(s) or cell
type(s). For a number of disorders of the above tissues or cells, particularly of the
immune and hepatic systems, expression of this gene at significantly higher or lower
20 levels may be routinely detected in certain tissues or cell types (e.g., developmental,
hepatic, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., serum,
plasma, bile, breast milk, urine, synovial fluid and spinal fluid) or another tissue or cell
sample taken from an individual having such a disorder, relative to the standard gene
expression level, i.e., the expression level in healthy tissue or bodily fluid from an
25 individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
NO:182 as residues: Pro-30 to Gln-37, Arg-39 to Ser-45, Arg-74 to Arg-85.

The tissue distribution in liver, combined with the detected GAS biological
activity indicates polynucleotides and polypeptides corresponding to this gene are useful
30 for the treatment or diagnosis of hepatic conditions such as hepatocellular carcinoma.
Moreover, the expression within embryonic tissue and other cellular sources marked by
proliferating cells indicates that this protein may play a role in the regulation of cellular
division, and may show utility in the diagnosis and treatment of cancer and other
proliferative disorders. Similarly, developmental tissues rely on decisions involving cell
35 differentiation and/or apoptosis in pattern formation. Thus this protein may also be
involved in apoptosis or tissue differentiation and could again be useful in cancer

The tissue distribution in prostate indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of cancers, particularly of the prostate. The expression within tonsils indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of a variety of immune system disorders. The expression also indicates a role in regulating the proliferation; survival; differentiation; and/or activation of hematopoietic cell lineages, including blood stem cells. Moreover, the expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:69 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1662 of SEQ ID NO:69, b is an integer of 15 to 1676, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:69, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 60

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ELSGLG (SEQ ID NO:604). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in the brain.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, central nervous system disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for

FEATURES OF PROTEIN ENCODED BY GENE NO: 61

5 The gene encoding the disclosed cDNA is believed to reside on chromosome 3. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 3.

 This gene is expressed primarily in the brain.

 Therefore, polynucleotides and polypeptides of the invention are useful as
10 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, CNS diseases, such as Alzheimers and Parkinson's disease. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a
15 number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to
20 the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:185 as residues: Asp-44 to Cys-53, Asp-56 to Lys-66, Ser-78 to Lys-84.

 The tissue distribution in brain tissue indicates polynucleotides and polypeptides
25 corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of CNS diseases such as Alzheimers and Parkinson's disease. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Huntington's Disease, Tourette Syndrome,
30 meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance,
35 and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition,

fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in colon indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of some gastrointestinal disorders, particularly cancers. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:72 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1998 of SEQ ID NO:72, b is an integer of 15 to 2012, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:72, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 63

This gene is expressed primarily in bone marrow.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a

FEATURES OF PROTEIN ENCODED BY GENE NO: 64

When tested against sensory neuron cell lines, supernatants removed from cells containing this gene activated the EGR1 assay. Thus, it is likely that this gene activates sensory neuronal cells through a signal transduction pathway. Early growth response 1 (EGR1) is a promoter associated with certain genes that induces various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation.

This gene is expressed primarily in the testes.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive system-related diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., testes, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in testes indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of reproductive system-related diseases. Furthermore, the tissue distribution indicates that polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of conditions concerning proper testicular function (e.g. endocrine function, sperm maturation), as well as cancer. Therefore, this gene product is useful in the treatment of male infertility and/or impotence. This gene product is also useful in assays designed to identify binding agents, as such agents (antagonists) are useful as male contraceptive agents. Similarly, the protein is believed to be useful in the treatment and/or diagnosis of testicular cancer. The testes are also a site of active gene expression of transcripts that may be expressed, particularly at low levels, in other tissues of the body. Therefore, this gene product may be expressed in other specific tissues or organs where it may play related functional roles in other processes, such as hematopoiesis, inflammation, bone formation, and kidney function, to name a few possible target indications.

specific joint abnormalities as well as chondrodysplasias (ie. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:75 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1556 of SEQ ID NO:75, b is an integer of 15 to 1570, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:75, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 66

This gene is expressed primarily in ovarian cancer, and to a lesser extent in fetal tissues such as fetal liver and fetal brain.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, cancers, particularly of the ovary. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., ovary, fetal, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:190 as residues: Pro-28 to Gln-33.

reproductive or hormonal disorders. Furthermore, the tissue distribution indicates that polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of conditions concerning proper testicular function (e.g. endocrine function, sperm maturation), as well as cancer. Therefore, this gene product is useful in the treatment of male infertility and/or impotence. This gene product is also useful in assays designed to identify binding agents, as such agents (antagonists) are useful as male contraceptive agents. Similarly, the protein is believed to be useful in the treatment and/or diagnosis of testicular cancer. The testes are also a site of active gene expression of transcripts that may be expressed, particularly at low levels, in other tissues of the body. Therefore, this gene product may be expressed in other specific tissues or organs where it may play related functional roles in other processes, such as hematopoiesis, inflammation, bone formation, and kidney function, to name a few possible target indications. Protein, as well as, antibodies directed against the protein may show utility as a tissue-specific marker and/or immunotherapy target for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:77 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1292 of SEQ ID NO:77, b is an integer of 15 to 1306, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:77, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 68

When tested against U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1465 of SEQ ID NO:78, b is an integer of 15 to 1479, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:78, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 69

10 This gene is expressed primarily in human thymus and six week old human embryo.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, endocrine diseases and leukemia. Similarly, polypeptides and antibodies
15 directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the endocrine and immune systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., endocrine, immune, cancerous and wounded
20 tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in thymus and developing embryonic tissues indicates
25 that polynucleotides and polypeptides corresponding to this gene are useful for the treatment of leukemia or other immune diseases, especially those which are involved in fetal development. Furthermore, the tissue distribution in thymus and developing embryonic tissues indicates that polynucleotides and polypeptides corresponding to this gene are useful for the detection, treatment, and/or prevention of various endocrine
30 disorders and cancers, particularly Addison's disease, Cushing's Syndrome, and disorders and/or cancers of the pancreas (e.g. diabetes mellitus), adrenal cortex, ovaries, pituitary (e.g., hyper-, hypopituitarism), thyroid (e.g. hyper-, hypothyroidism), parathyroid (e.g. hyper-, hypoparathyroidism), hypothalamus, and testes. Protein, as well as, antibodies directed against the protein may show utility as a
35 tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ

and polypeptides corresponding to this gene are useful for the diagnosis and intervention of lung tumors. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and immunotherapy targets for the above listed tumors and tissues.

- 5 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:80 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.
- 10 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of $a-b$, where a is any integer between 1 to 1266 of SEQ ID NO:80, b is an integer of 15 to 1280, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:80, and where b is greater than or equal to $a + 14$.

15

FEATURES OF PROTEIN ENCODED BY GENE NO: 71

- 20 When tested against K562 leukemia cell lines, supernatants removed from cells containing this gene activated the ISRE assay. Thus, it is likely that this gene activates leukemia cells through the Jak-STAT signal transduction pathway. The interferon-sensitive response element is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells.
- 25 Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. Furthermore, contact of cells with supernatant expressing the product of this gene increases the permeability of THP-1 monocyte cells to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated
- 30 when the product of this gene binds a receptor on the surface of the monocyte cell. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating monocyte cells.

This gene is expressed primarily in adult human spleen and adult human testis.

- 35 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune disorders. Similarly, polypeptides and antibodies directed to

IAIVITLFPFISWVYIY (SEQ ID NO:613), and/or RKEGGGPYVAGLTAPHVAGLTAPRRVLRAMAP (SEQ ID NO:614). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in liver tissues, and to a lesser extent in t-cell lymphoma.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, hepatitis, sclerosis of the liver and cancer of the liver. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in liver indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and possible treatment of diseases of the liver. Since it is primarily found in the liver, and with the additional expression seen in T-cells, it most likely deals with the immune response in the liver, for example to diseases like hepatitis, sclerosis and hepatocellular carcinoma. More generally, the tissue distribution in liver indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection and treatment of liver disorders and cancers (e.g. hepatoblastoma, jaundice, hepatitis, liver metabolic diseases and conditions that are attributable to the differentiation of hepatocyte progenitor cells). Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:82 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1941 of SEQ ID NO:82, b is an integer of 15

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 624 of SEQ ID NO:83, b is an integer of 15 to 638, where both a and b correspond to the positions of nucleotide residues shown in
5 SEQ ID NO:83, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 74

10 The translation product of this gene shares sequence homology with "neurogenic secreted signaling protein (brn)" (see gil1150971) from *Drosophila melanogaster* which is thought to be important in the normal development of brain tissue. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: PGRPTRPAXAGLSSGGAAQEAPQADPRPWLAR (SEQ ID
15 NO:615). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in the placenta and early embryonic tissue. Northern data has demonstrated that this gene is expressed in brain, stomach and colorectal adenocarcinoma.

20 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, several types of disorders of the brain including epilepsy, mood disorders, any of a variety of types of mental retardation, and addictive disorders
25 including alcoholism. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., brain,
30 stomach, colon, placental, embryonic, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

35 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:198 as residues: Gln-37 to Ala-42, Thr-51 to Ala-57, Pro-71 to His-79, Glu-124 to Arg-137, Ser-151 to Val-159.

FEATURES OF PROTEIN ENCODED BY GENE NO: 75

5 The translation product of this gene shares sequence homology with a fat-specific secreted protein.

This gene is expressed primarily in the epididymus.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, metabolic disorders and male infertility. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the metabolic and reproductive systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., epididymus, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

20 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:199 as residues: Tyr-21 to Asp-40, Ser-58 to Arg-64, Thr-71 to Ser-76, Ser-106 to Thr-112.

Homology to a fat-specific gene indicates that this gene may also play a role in the treatment and/or detection of metabolic disorders such as obesity, diabetes, anorexia nervosa and bulimia. In addition, its expression primarily in the epididymus indicates a role in the treatment/detection of male fertility disorders such as infertility, low sperm count, spermatorrhea and spermiation. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

30 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:85 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

35 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1115 of SEQ ID NO:85, b is an integer of 15

types (e.g., cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:200 as residues: Glu-25 to Lys-33, Glu-115 to Lys-120.

The tissue distribution primarily in brain and homology to Slit, a gene involved in axon pathway development, indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment/detection of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, spinal cord injury, brain injuries, crushed (optic) nerve, amyotrophic lateral sclerosis, diabetes caused nerve damage, strokes, epilepsy, multiple sclerosis, paraplegia retinal degeneration, Huntingtons Disease, facial nerve damage, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder and panic disorder. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:86 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 2660 of SEQ ID NO:86, b is an integer of 15 to 2674, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:86, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 77

The translation product of this gene shares sequence homology with human endothelial cell multimerin, which is a secreted protein that binds to the extracellular matrix and is thought to be involved in hemostasis. Multimerin is a factor V/Va-binding protein and may function as a carrier protein for platelet factor V (J. Biol Chem 1995 Aug 4;270(31):18246-51). Contact of cells with supernatant expressing the product of this gene increases the permeability of THP-1 Monocyte cells to calcium. Thus, it is

product may be produced more generally in endothelial cells or within the circulation. In such instances, it may play more generalized roles in vascular function, such as in angiogenesis. It may also be produced in the vasculature and have effects on other cells within the circulation, such as hematopoietic cells, as supported by the biological activity data mentioned previously. It may serve to promote the proliferation, survival, activation, and/or differentiation of hematopoietic cells, as well as other cells throughout the body. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:87 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1622 of SEQ ID NO:87, b is an integer of 15 to 1636, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:87, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 78

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

HYXSTPGRVPVRQFAAASTSGGPWVPGGXLEAPFQVAPSLSHSTPVFPGLI (SEQ ID NO:616). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in osteoblasts.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, degenerative conditions of the bone including arthritis and osteoporosis. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the skeletal system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., skeletal, cancerous and wounded

110 Human Secreted Proteins

Field of the Invention

This invention relates to newly identified polynucleotides and the polypeptides encoded by these polynucleotides, uses of such polynucleotides and polypeptides, and
5 their production.

Background of the Invention

Unlike bacterium, which exist as a single compartment surrounded by a membrane, human cells and other eucaryotes are subdivided by membranes into many functionally distinct compartments. Each membrane-bounded compartment, or
10 organelle, contains different proteins essential for the function of the organelle. The cell uses "sorting signals," which are amino acid motifs located within the protein, to target proteins to particular cellular organelles.

One type of sorting signal, called a signal sequence, a signal peptide, or a leader sequence, directs a class of proteins to an organelle called the endoplasmic reticulum
15 (ER). The ER separates the membrane-bounded proteins from all other types of proteins. Once localized to the ER, both groups of proteins can be further directed to another organelle called the Golgi apparatus. Here, the Golgi distributes the proteins to vesicles, including secretory vesicles, the cell membrane, lysosomes, and the other organelles.

Proteins targeted to the ER by a signal sequence can be released into the
20 extracellular space as a secreted protein. For example, vesicles containing secreted proteins can fuse with the cell membrane and release their contents into the extracellular space - a process called exocytosis. Exocytosis can occur constitutively or after receipt of a triggering signal. In the latter case, the proteins are stored in secretory vesicles (or
25 secretory granules) until exocytosis is triggered. Similarly, proteins residing on the cell membrane can also be secreted into the extracellular space by proteolytic cleavage of a "linker" holding the protein to the membrane.

Despite the great progress made in recent years, only a small number of genes encoding human secreted proteins have been identified. These secreted proteins include
30 the commercially valuable human insulin, interferon, Factor VIII, human growth hormone, tissue plasminogen activator, and erythropoietin. Thus, in light of the pervasive role of secreted proteins in human physiology, a need exists for identifying and characterizing novel human secreted proteins and the genes that encode them. This knowledge will allow one to detect, to treat, and to prevent medical disorders by using
35 secreted proteins or the genes that encode them.

Summary of the Invention

The present invention relates to novel polynucleotides and the encoded polypeptides. Moreover, the present invention relates to vectors, host cells, antibodies, and recombinant methods for producing the polypeptides and polynucleotides. Also provided are diagnostic methods for detecting disorders related to the polypeptides, and therapeutic methods for treating such disorders. The invention further relates to screening methods for identifying binding partners of the polypeptides.

Detailed Description

Definitions

The following definitions are provided to facilitate understanding of certain terms used throughout this specification.

In the present invention, "isolated" refers to material removed from its original environment (e.g., the natural environment if it is naturally occurring), and thus is altered "by the hand of man" from its natural state. For example, an isolated polynucleotide could be part of a vector or a composition of matter, or could be contained within a cell, and still be "isolated" because that vector, composition of matter, or particular cell is not the original environment of the polynucleotide.

In the present invention, a "secreted" protein refers to those proteins capable of being directed to the ER, secretory vesicles, or the extracellular space as a result of a signal sequence, as well as those proteins released into the extracellular space without necessarily containing a signal sequence. If the secreted protein is released into the extracellular space, the secreted protein can undergo extracellular processing to produce a "mature" protein. Release into the extracellular space can occur by many mechanisms, including exocytosis and proteolytic cleavage.

As used herein, a "polynucleotide" refers to a molecule having a nucleic acid sequence contained in SEQ ID NO:X or the cDNA contained within the clone deposited with the ATCC. For example, the polynucleotide can contain the nucleotide sequence of the full length cDNA sequence, including the 5' and 3' untranslated sequences, the coding region, with or without the signal sequence, the secreted protein coding region, as well as fragments, epitopes, domains, and variants of the nucleic acid sequence. Moreover, as used herein, a "polypeptide" refers to a molecule having the translated amino acid sequence generated from the polynucleotide as broadly defined.

In the present invention, the full length sequence identified as SEQ ID NO:X was often generated by overlapping sequences contained in multiple clones (contig

analysis). A representative clone containing all or most of the sequence for SEQ ID NO:X was deposited with the American Type Culture Collection ("ATCC"). As shown in Table 1, each clone is identified by a cDNA Clone ID (Identifier) and the ATCC Deposit Number. The ATCC is located at 10801 University Boulevard,
5 Manassas, Virginia 20110-2209, USA. The ATCC deposit was made pursuant to the terms of the Budapest Treaty on the international recognition of the deposit of microorganisms for purposes of patent procedure.

A "polynucleotide" of the present invention also includes those polynucleotides capable of hybridizing, under stringent hybridization conditions, to sequences contained
10 in SEQ ID NO:X, the complement thereof, or the cDNA within the clone deposited with the ATCC. "Stringent hybridization conditions" refers to an overnight incubation at 42°C in a solution comprising 50% formamide, 5x SSC (750 mM NaCl, 75 mM sodium citrate), 50 mM sodium phosphate (pH 7.6), 5x Denhardt's solution, 10% dextran sulfate, and 20 µg/ml denatured, sheared salmon sperm DNA, followed by washing the
15 filters in 0.1x SSC at about 65°C.

Also contemplated are nucleic acid molecules that hybridize to the polynucleotides of the present invention at lower stringency hybridization conditions. Changes in the stringency of hybridization and signal detection are primarily accomplished through the manipulation of formamide concentration (lower percentages
20 of formamide result in lowered stringency); salt conditions, or temperature. For example, lower stringency conditions include an overnight incubation at 37°C in a solution comprising 6X SSPE (20X SSPE = 3M NaCl; 0.2M NaH₂PO₄; 0.02M EDTA, pH 7.4), 0.5% SDS, 30% formamide, 100 µg/ml salmon sperm blocking DNA; followed by washes at 50°C with 1XSSPE, 0.1% SDS. In addition, to achieve even
25 lower stringency, washes performed following stringent hybridization can be done at higher salt concentrations (e.g. 5X SSC).

Note that variations in the above conditions may be accomplished through the inclusion and/or substitution of alternate blocking reagents used to suppress background in hybridization experiments. Typical blocking reagents include
30 Denhardt's reagent, BLOTTO, heparin, denatured salmon sperm DNA, and commercially available proprietary formulations. The inclusion of specific blocking reagents may require modification of the hybridization conditions described above, due to problems with compatibility.

Of course, a polynucleotide which hybridizes only to polyA+ sequences (such
35 as any 3' terminal polyA+ tract of a cDNA shown in the sequence listing), or to a

complementary stretch of T (or U) residues, would not be included in the definition of "polynucleotide," since such a polynucleotide would hybridize to any nucleic acid molecule containing a poly (A) stretch or the complement thereof (e.g., practically any double-stranded cDNA clone).

5 The polynucleotide of the present invention can be composed of any polyribonucleotide or polydeoxribonucleotide, which may be unmodified RNA or DNA or modified RNA or DNA. For example, polynucleotides can be composed of single- and double-stranded DNA, DNA that is a mixture of single- and double-stranded regions, single- and double-stranded RNA, and RNA that is mixture of single- and
10 double-stranded regions, hybrid molecules comprising DNA and RNA that may be single-stranded or, more typically, double-stranded or a mixture of single- and double-stranded regions. In addition, the polynucleotide can be composed of triple-stranded regions comprising RNA or DNA or both RNA and DNA. A polynucleotide may also contain one or more modified bases or DNA or RNA backbones modified for stability
15 or for other reasons. "Modified" bases include, for example, tritylated bases and unusual bases such as inosine. A variety of modifications can be made to DNA and RNA; thus, "polynucleotide" embraces chemically, enzymatically, or metabolically modified forms.

 The polypeptide of the present invention can be composed of amino acids joined
20 to each other by peptide bonds or modified peptide bonds, i.e., peptide isosteres, and may contain amino acids other than the 20 gene-encoded amino acids. The polypeptides may be modified by either natural processes, such as posttranslational processing, or by chemical modification techniques which are well known in the art. Such modifications are well described in basic texts and in more detailed monographs,
25 as well as in a voluminous research literature. Modifications can occur anywhere in a polypeptide, including the peptide backbone, the amino acid side-chains and the amino or carboxyl termini. It will be appreciated that the same type of modification may be present in the same or varying degrees at several sites in a given polypeptide. Also, a given polypeptide may contain many types of modifications. Polypeptides may be
30 branched, for example, as a result of ubiquitination, and they may be cyclic, with or without branching. Cyclic, branched, and branched cyclic polypeptides may result from posttranslation natural processes or may be made by synthetic methods. Modifications include acetylation, acylation, ADP-ribosylation, amidation, covalent attachment of flavin, covalent attachment of a heme moiety, covalent attachment of a
35 nucleotide or nucleotide derivative, covalent attachment of a lipid or lipid derivative, covalent attachment of phosphatidylinositol, cross-linking, cyclization, disulfide bond formation, demethylation, formation of covalent cross-links, formation of cysteine,

formation of pyroglutamate, formylation, gamma-carboxylation, glycosylation, GPI anchor formation, hydroxylation, iodination, methylation, myristoylation, oxidation, pegylation, proteolytic processing, phosphorylation, prenylation, racemization, selenoylation, sulfation, transfer-RNA mediated addition of amino acids to proteins such as arginylation, and ubiquitination. (See, for instance, PROTEINS - STRUCTURE AND MOLECULAR PROPERTIES, 2nd Ed., T. E. Creighton, W. H. Freeman and Company, New York (1993); POSTTRANSLATIONAL COVALENT MODIFICATION OF PROTEINS, B. C. Johnson, Ed., Academic Press, New York, pgs. 1-12 (1983); Seifter et al., Meth Enzymol 182:626-646 (1990); Rattan et al., Ann NY Acad Sci 663:48-62 (1992).)

"SEQ ID NO:X" refers to a polynucleotide sequence while "SEQ ID NO:Y" refers to a polypeptide sequence, both sequences identified by an integer specified in Table 1.

"A polypeptide having biological activity" refers to polypeptides exhibiting activity similar, but not necessarily identical to, an activity of a polypeptide of the present invention, including mature forms, as measured in a particular biological assay, with or without dose dependency. In the case where dose dependency does exist, it need not be identical to that of the polypeptide, but rather substantially similar to the dose-dependence in a given activity as compared to the polypeptide of the present invention (i.e., the candidate polypeptide will exhibit greater activity or not more than about 25-fold less and, preferably, not more than about tenfold less activity, and most preferably, not more than about three-fold less activity relative to the polypeptide of the present invention.)

Polynucleotides and Polypeptides of the Invention

FEATURES OF PROTEIN ENCODED BY GENE NO: 1

The translation product of this gene shares sequence homology with a neurogenic secreted signaling protein, in addition to the human UDP-galactose:2-acetamido-2-deoxy-D-glucose3beta-galactosyltransferase (See Genbank Accession No. gnllPIDle1237254) which is thought to be vital in glycoprotein biosynthesis. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: GLGPAQVALSLQGPA (SEQ ID NO:239), SSWMAGTQPRTSWWEMSS AKPCPTGTLRSNTSSHPQCTGPPTTHPMLVGEDMSCPEPQCGASRLSWKMNS

SPLMMSLWVCA (SEQ ID NO:240), QPRTSWWEMSSAKPCPTGTLRSN (SEQ ID NO:241), MSCPEPQCGASRLSWKMLNSSPL (SEQ ID NO:242), WVLYIEG GMKYLT LVFLLGRAWRMTSPTRRSWAGSQPSRNSNTLGTWTKTSSSPFSMK WAWGQAATTQRCRCSSLSVRLKKSSVKSHWRMSSNSLLS (SEQ ID NO:243),
 5 GGMKYLT LVFLLGRAWRMTS (SEQ ID NO:244), SQPSRNSNTLGTWTKTS SSPFSMKW (SEQ ID NO:245), and/or TTQRCRCSSLSVRLKKSSVKSHWRMS (SEQ ID NO:246). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 12. Accordingly, polynucleotides related to this invention are useful as a
 10 marker in linkage analysis for chromosome 12.

This gene is expressed primarily in human fetal brain, epileptic frontal cortex and 12 week old early stage human.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a
 15 biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural or immune disorders, particularly neurodegenerative conditions such as epilepsy. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells,
 20 particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene
 25 expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:125 as residues: Ala-27 to Ser-38, Pro-43 to Asn-54, Thr-115 to Asp-121, Leu-225 to Val-232, Pro-247 to Gly-252, Arg-306 to Leu-311.

30 The tissue distribution in fetal brain tissue, combined with the homology to a neurogenic secreted signaling protein, in addition to the conserved UDP-galactose:2-acetamido-2-deoxy-D-glucose3beta-galactosyltransferase protein indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment, detection, and/or prevention of a variety of neural disorders, particularly
 35 epilepsy and other disorders of the CNS. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are

not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. In addition, the protein may show utility in the creation of novel therapeutics which depend upon the localizing benefits (cell and tissue specificity) of glycoproteins. This protein may also be used to produce physiologically active saccharide chains and variants, and for improvement of saccharide chains bound to physiologically active proteins. Expression within fetal tissue and other cellular sources marked by proliferating cells indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:11 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1257 of SEQ ID NO:11, b is an integer of 15 to 1271, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:11, and where b is greater than or equal to a + 14.

35 FEATURES OF PROTEIN ENCODED BY GENE NO: 2

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ASTLAQ

TTGTCKXXXSSRRARSRTQRXFQLRPDKRSAPSLQFIQAQEELSKENTGRQLA
 AREAVLALEGSTQLTG PVTQVAASKTHCSGMALTASPVPVLGAAPAKXPTQ
 5 NXPGQXGRAXXKVXTSWXXVATKVLHGLEVSTHLGKRKLSGRSWLPGP
 ALHATPSQSHTQTGSQIVHPPQGEVREVGRGRGQPPAQPVHAHPSQQHPSPAH
 LAGLSLWTGTA (SEQ ID NO:247), AMLETWRPGPSXGELATNSGQRASQDSQ
 HSPPHVRAHLLISPLPAFPSMGGPAGRSAPXXLTETKSELQRLRRRQARASXS
 XPAGEPGAGHSDSFNCVPTNGQPLRSCSLSKLRRSFLKRTQGDSWLPEKQSW
 10 LWKAPPS (SEQ ID NO:248), SHQSHLINPASSAKGSWAQLKAQPPAHVLGGT
 GQEGPPPTADQPESPGWDPSSFTNGSSGPRALPTSVHPTLQQGAPCRRNWA
 PCRLVETRMRLRRQLPHGTSKRDLGWASLQRGSPQETPQ (SEQ ID NO:249),
 RPDKRSAPSLQFIQAQEELSKENTGRQLAAREAV (SEQ ID NO:250), ATPSQ
 SHTQTGSQIVHPPQGEVREVGRGRGQPP (SEQ ID NO:251), QDSQHSPPHVR
 15 AHLLISPLPAFPSMGGPA (SEQ ID NO:252), DSFNCVPTNGQPLRSCSL
 KLRRSFLKR (SEQ ID NO:253), KGSWAQLKAQPPAHVLGGTGQEGPP (SEQ ID
 NO 254:), KPSHQ (SEQ ID NO:256), and/or APSLLQFIQAQEELSKENTGRQLA
 AR (SEQ ID NO:255). Polynucleotides encoding these polypeptides are also
 encompassed by the invention.

20 This gene is expressed exclusively in adult human testis.

Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, reproductive disorders, particularly abnormalities of the testis, in addition
 25 to impotence and infertility. Similarly, polypeptides and antibodies directed to these
 polypeptides are useful in providing immunological probes for differential identification
 of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells,
 particularly of the male reproductive system, expression of this gene at significantly
 higher or lower levels may be routinely detected in certain tissues or cell types (e.g.,
 30 reproductive, testicular, adrogen regulated, and cancerous and wounded tissues) or
 bodily fluids (e.g., lymph, serum, plasma, seminal fluid, urine, synovial fluid and
 spinal fluid) or another tissue or cell sample taken from an individual having such a
 disorder, relative to the standard gene expression level, i.e., the expression level in
 healthy tissue or bodily fluid from an individual not having the disorder.

35 Preferred epitopes include those comprising a sequence shown in SEQ ID
 NO:126 as residues: His-45 to Gly-56, Trp-62 to Tyr-68, His-94 to Trp-100.

The tissue distribution in testis indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention for abnormalities of the reproductive system. In addition, expression of this gene product in the testis may implicate this gene product in normal testicular function. This gene product may be useful in the treatment of male infertility, and/or could be used as a male contraceptive. Moreover, the protein product of this gene may be useful in the treatment, detection, and/or prevention of a variety of disorders related to androgen-regulated tissues, particularly the prostate gland. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:12 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1437 of SEQ ID NO:12, b is an integer of 15 to 1451, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:12, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 3

The translation product of this gene shares sequence homology with the human VAKTI precursor (See Genbank Accession No. gnlIPIDle1311078 (AJ228139)), in addition to the ovoinhibitor and thrombin inhibitors, which are thought to be important in inhibition of protease activities. Contact of cells with supernatant expressing the product of this gene has been shown to increase the permeability of the plasma membrane of monocytes to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product binds a receptor on the surface of the plasma membrane of both immune cells, in addition to other cell-lines or tissue cell types. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating monocytes. Binding of a ligand to a receptor is known to alter intracellular levels of small molecules, such as calcium, potassium and sodium, as well as alter pH and membrane potential. Alterations in small molecule concentration can be measured to identify supernatants which bind to

receptors of a particular cell. Moreover, when tested against NIH3T3 and U937 cell lines, supernatants removed from cells containing this gene activated the EGR1 (early growth response) and GAS (gamma activating sequence) promoter elements. Thus, it is likely that this gene activates fibroblasts or hematopoietic cells through the EGR1 and/or JAK-STAT signal transduction pathway. EGR1 is a separate signal transduction pathway from Jak-STAT, genes containing the EGR1 promoter are induced in various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. GAS is also a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells.

Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: CSYRPQFPVDPRVRATCIVFN (SEQ ID NO:257), GTENLLA PERTILSRAQMKGCMATPAPCVRSSSKQKKKKRKRRKVXQETKDNLRVQLPL XSCVVNXANPGKTDGFFAPERMTSPSRAQMEKCMATPAPCVRPSFNKKKEQE QRLKEKLQRKSAVNFGTK (SEQ ID NO:258), LLAPERTILSRAQMKGCMAT PAPCVR (SEQ ID NO:259), PGKTDGFFAPERMTSPSRAQMEKCM (SEQ ID NO:260), EQRLKEKLQRKSAVNFG (SEQ ID NO:261), KTLLENFSTQGTFVAMH PAVRATDWITLPCTKKPSISHLFFXFLAKILFSISSNSSFTLSLGIFSFFXXQLST HCTLIAMRLPIRTKNRIIFPCASKSSISNKGPKSTAYILLWITALTFPFTFYTNL GPGFRILSTQCTSVVICFPICATNSFIIIRTDKIPISFSFFKIITIQLC WGSSLGSSC (SEQ ID NO:262), MHPAVRATDWITLPCTKKPSIS (SEQ ID NO:263), LIAMRLP IRTKNRIIFP (SEQ ID NO:264), SSISNKGPKSTAYILL WITALTFPFT (SEQ ID NO:265), IIIRTDKIPISFSFFKIITIQLC (SEQ ID NO:266), NDGQCLAYNTTHY RERAMTSHARVSLGPSRDPLERPPFFFFFFFFFFFFKFEHTGTHGTLVSMHFAI WATDRIMLPGAYKCSIPHLVPKFTADFLCSFSFSLCSCSFFLLKEGLTHGAGVA MHFSIWALDGVILSGAKKPSVFPGFAXFTTQLXKGSCTL RLSFVS (SEQ ID NO:267), CLAYNTTHYRERAMTSHARVSL (SEQ ID NO:268), GTLVSMHFAI WATDRIMLPGAYKCSIPHLVP (SEQ ID NO:269), GVILSGAKK PSVFPGFAX FTTQLX (SEQ ID NO:270), KKASHMEQVLP CIPSGPWMGFSLSLXQKSRPF FLDLRXSLHNSXKEAVLLDCLLFLXXPSFFFFSSSSAWKKTSHMEQVLPCT FPSGPWIGLFSLVQASFPFLTFRYSLQSSAYEVAFPDSSLFLARASAFFSSFSA WK (SEQ ID NO:271), CIPSGPWMGFSLSLXQKSRPFFLDLRXS (SEQ ID NO:272), WIGLFSLVQASFPFLTFRYSLQSSAYE (SEQ ID NO:273), NSAVN IKIRQRMEYFSVPEKMTLFVVQMGKCMATCVCVKPTSKQKMKKRKRLKHE LETKENLEKQPHMQSFAVNIESL (SEQ ID NO:274), IKIRQRMEYFSVPEKMTL

FVVQM (SEQ ID NO:275), and/or VKPTSKQKMKKRKRLKHELETKENL (SEQ ID NO:276). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 5. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 5.

This gene is expressed primarily in heart, tonsils, Hodgkin's lymphoma, neuroblastoma, leukocyte and lung.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, cardiovascular, immune, or hemodynamic disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the circulatory system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., cardiovascular, muscle, immune, hematopoietic, pulmonary, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, pulmonary surfactant or sputum, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:127 as residues: Ala-20 to Gln-27.

The tissue distribution in heart and immune cells and tissues, the homology to protease inhibitors, in addition to the detected calcium flux, EGR1, and GAS biological activities indicates polynucleotides and polypeptides corresponding to this gene are useful for diagnosis and treatment of hemodynamic or vascular disorders, including hemorrhage, heart failure, and embolism, because proteases and their inhibitors are often involved in the cascades controlling hemodynamic controls. Protein may also show utility in the treatment, detection, and/or prevention of a variety of metabolic (i.e. cellular or physiological) and/or proliferative disorders in which aberrant regulation of a protease is thought to be involved, particularly in the premature activation of zymogens, for example. The secreted protein can also be used to determine biological activity, to raise antibodies, as tissue markers, to isolate cognate ligands or receptors, to identify agents that modulate their interactions and as nutritional supplements. It may also have a very wide range of biological activities. Typical of these are cytokine, cell proliferation/differentiation modulating activity or induction of other cytokines;

immunostimulating/immunosuppressant activities (e.g. for treating human immunodeficiency virus infection, cancer, autoimmune diseases and allergy); regulation of hematopoiesis (e.g. for treating anemia or as adjunct to chemotherapy); stimulation or growth of bone, cartilage, tendons, ligaments and/or nerves (e.g. for treating wounds, stimulation of follicle stimulating hormone (for control of fertility); chemotactic and chemokinetic activities (e.g. for treating infections, tumors); hemostatic or thrombolytic activity (e.g. for treating hemophilia, cardiac infarction etc.); anti-inflammatory activity (e.g. for treating septic shock, Crohn's disease); as antimicrobials; for treating psoriasis or other hyperproliferative diseases; for regulation of metabolism, and behavior. Also contemplated is the use of the corresponding nucleic acid in gene therapy procedures. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:13 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 2303 of SEQ ID NO:13, b is an integer of 15 to 2317, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:13, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 4

The translation product of this gene shares sequence homology with the ecotropic retrovirus receptor and the human cationic amino acid transporter-3 (See Genbank Accession No. gnlPIDle1198517) which are thought to be important in viral infections and amino acid and polyamine transport. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

PRVRGTVVRLRQHRPSAYILVSTVLTLMVPWHS�DPDSALADAFYQRGYRWAG
 FIVAAGSICA (SEQ ID NO:277), TVVRLRQHRPSAYILVSTVLTLMVP (SEQ ID
 NO:278), WHSLDPDSALADAFYQRGYRWAGFIV (SEQ ID NO:279), TPSCSASS
 SPCHALSMPWPPMGSSSRCLPMCTPGHRCLWRAPWRSGSSRPSWHCCWTWS

RWFSSCPLAHSWPTHSWPPVSLCCASRSLPRPAPQAQPALAP (SEQ ID NO:280), LSMPWPPMGSSSRCLPMCTPGHRC (SEQ ID NO:281), APWRSGSS RPSWHCCWTWSRWFSSCPL (SEQ ID NO:282), THSWPPVSLCCASRSL PRPAPQ (SEQ ID NO:283), AYILVSTVLTLMVPWHSLDPDSALADAFYQRGYRW
 5 AGFIVAAGSICAMNTVLLSLLFSLP (SEQ ID NO:284), PWHSLDPDSALADAF YQRGYRWAGFIVAAGS (SEQ ID NO:285), RIVYAMAADGLFFQVFAHVHPRTQ VPV (SEQ ID NO:286), DLESLVQFLSLGTLLA (SEQ ID NO:287), YTFVATSI VLRFAQK (SEQ ID NO:288), LTKQQSSFSDDLQLVGTVHASVPEPGELKPA (SEQ ID NO:289), LRPYLGFLDGYSPGAVVTWALGVMLASAITIGCVLVFGNSTL
 10 HLPHWGYI (SEQ ID NO:290), PGAVVTWALGVMLASAITIGCVLVFGN (SEQ ID NO:291), GAHQQQYREDLFQIPMVPLIPALSIVLNICLMLKLSYLTWVRFSIW LLMGLAV (SEQ ID NO:292), MVPLIPALSIVLNICLMLKLSYLTWV (SEQ ID NO:293), and/or YFGYGIRHSKENQRELPLNSTHYVVFPR (SEQ ID NO:294).
 Polynucleotides encoding these polypeptides are also encompassed by the invention.

15 This gene is expressed primarily in placenta and brain tissue.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, neural, or metabolic disorders, in addition to viral
 20 infections. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system and placenta, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g.,
 25 reproductive, neural, hepatic, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, bile, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

30 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:128 as residues: Gln-87 to Ser-99, Pro-102 to Phe-110, Gln-204 to Leu-211, Ser-262 to Glu-268, Pro-294 to His-305.

The tissue distribution in placenta, combined with the homology to a retroviral receptor and cationic amino acid transporters, indicates polynucleotides and
 35 polypeptides corresponding to this gene are useful for the diagnosis and intervention of viral infections, or diseases and malfunctions related to amino acid transport. Specifically, soluble forms of this protein or, polynucleotides of the present invention,

can be used to bind to retroviruses so as to prevent their entry and infection of susceptible cells. They can be used for therapy/prevention of HIV infection and certain forms of leukaemia. Polynucleotide or polypeptides of the present invention can be used to identify susceptibility to retroviral infection. Based upon the tissue distribution in the brain, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:14 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1458 of SEQ ID NO:14, b is an integer of 15 to 1472, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:14, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 5

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: FPPSPAPPHSLPLRSWLWSRQMG (SEQ ID NO:295), GTSF RGMISTQPGSTPLASFKILALESADGHGGCSAGNDIGPYGERDDQQVFIQKVVP SASQLFVRLSSTGQRVCSVRSVDGSPTTAFTVLECEGSPAARLSAPALPAHWP

GQRQLGHVGPNNHRHGRPRPGPCRWDGAR ADGTAGTL (SEQ ID NO:296),
 PGSTPLASFKILALESADGHGGCSAGNDI (SEQ ID NO:297), GERDDQQVF
 IQKVVPSASQLFVRL (SEQ ID NO:298), RSV DGSPTTAFTVLECEGSPAARLS
 (SEQ ID NO:299), PALPAHWPGQRQLGHVGPNNHRHGRPR (SEQ ID NO:300),
 5 PFIPRRPWPEPGVPTGIREAPESPRTRASQGIMAAALFKKEVSLSFILGGVRG
 VPRPLEGHGAGVGGRRRSGLRTSSWQRSTKLPPRRRRASACGGLGLPRWP
 DKEVLLEAEWRLVREMRGEGLGRQPHEGAERSRRGQLTVFQLFHQLLLRQATC
 RGLA EAVHGGG (SEQ ID NO:301), PGVPTGIREAPESPRTRASQGIMAAALF
 KKEV (SEQ ID NO:302), FILGGVRGVPRPLEGHGAGVGGRRRSGLP (SEQ ID
 10 NO:303), GLPRWPDKEVLLEAEWRLVREMRG (SEQ ID NO:304), and/or GAER
 SRRGQLTVFQLFHQLLLRQ (SEQ ID NO:305). Polynucleotides encoding these
 polypeptides are also encompassed by the invention.

This gene is expressed primarily in human fetal kidney, and to a lesser extent, in
 thymus and bone marrow cell line (RS4;11).

15 Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, developmental, metabolic, immune or hematopoietic disorders.
 Similarly, polypeptides and antibodies directed to these polypeptides are useful in
 20 providing immunological probes for differential identification of the tissue(s) or cell
 type(s). For a number of disorders of the above tissues or cells, particularly of the
 immune system, expression of this gene at significantly higher or lower levels may be
 routinely detected in certain tissues or cell types (e.g., developmental, metabolic,
 immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g.,
 25 lymph, serum, amniotic fluid, plasma, urine, synovial fluid and spinal fluid) or another
 tissue or cell sample taken from an individual having such a disorder, relative to the
 standard gene expression level, i.e., the expression level in healthy tissue or bodily
 fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
 30 NO:129 as residues: Thr-17 to Trp-26, Pro-54 to Trp-61, Ala-65 to Arg-74, Pro-142 to
 Leu-147, Pro-158 to Ala-165.

The tissue distribution in thymus and bone marrow cell lines indicates
 polynucleotides and polypeptides corresponding to this gene are useful for the
 diagnosis, treatment, and/or prevention of immune disorders involving stem cells.
 35 Moreover, polynucleotides and polypeptides corresponding to this gene are useful for
 the treatment and diagnosis of hematopoietic related disorders such as anemia,
 pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are

important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Alternatively, the expression within fetal kidney indicates that this gene or gene product could be used in the treatment and/or detection of kidney diseases including renal failure, nephritis, renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and kidney stones, in addition to Wilm's Tumor Disease, and congenital kidney abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome. Moreover, the expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:15 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1002 of SEQ ID NO:15, b is an integer of 15 to 1016, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:15, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 6

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: HASAHASAHASGCGA (SEQ ID NO:306), QGVGVADDEGG

LERQRVDAGARLGHMGQPVAFSTRQLHLALPAPGTAGVTVPHPHAREGVV
GDLPLVPDAEDPTVGVPAEGLLVLGHVVERAELILVRGLHQAEALARESEEMH
GSRHG (SEQ ID NO:307), EGGLERQRVDAGARLGHMGQPVAFS (SEQ ID
NO:308), LALPAPGTAGVTVPHPHAREGVVGDPLV (SEQ ID NO:309), PAEG
5 LLVLGHVVERAELILVRGLHQAEA (SEQ ID NO:310), HLFKFFYTIAFMQWF
TEFMELFLSVWELIKTXNLFCVCFSEHKPGQLVPAGPTSQLLCRALGRVH
LCSPTTRSQTPTQSWVTPQLLWRLGSGRLVAQVLQVGSFCGPRVGDVAVLGEQT
FQPFDLL (SEQ ID NO:311), AFMQWFTEFMELFLSVWELIKTXNLFCVC (SEQ
ID NO:312), and/or RSQTPTQSWVTPQLLWRLGSGRLVAQ (SEQ ID NO:313).

- 10 Polynucleotides encoding these polypeptides are also encompassed by the invention.
The gene encoding the disclosed cDNA is believed to reside on chromosome 16.
Accordingly, polynucleotides related to this invention are useful as a marker in linkage
analysis for chromosome 16.

- This gene is expressed primarily in human infant brain, and to a lesser extent, in
15 adult brain and lung.

- Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, neural, developmental, or pulmonary disorders. Similarly, polypeptides
20 and antibodies directed to these polypeptides are useful in providing immunological
probes for differential identification of the tissue(s) or cell type(s). For a number of
disorders of the above tissues or cells, particularly of the central nervous system
(CNS), expression of this gene at significantly higher or lower levels may be routinely
detected in certain tissues or cell types (e.g., neural, developmental, pulmonary, and
25 cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine,
amniotic fluid, synovial fluid and spinal fluid) or another tissue or cell sample taken
from an individual having such a disorder, relative to the standard gene expression
level, i.e., the expression level in healthy tissue or bodily fluid from an individual not
having the disorder.

- 30 Preferred epitopes include those comprising a sequence shown in SEQ ID
NO:130 as residues: Ser-47 to Pro-57, Ser-77 to Glu-82, Thr-90 to Trp-98, Arg-124 to
Lys-137, Ala-183 to Glu-192, Lys-220 to Gln-229, Asn-244 to Arg-258, Thr-271 to
Asn-278, Glu-285 to Gly-297.

- The tissue distribution in infant and adult brain indicates polynucleotides and
35 polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or
prevention of diseases of the CNS, such as mental retardation, schizophrenia,
Alzheimer's disease, paranoia, depression, and mania. Moreover, polynucleotides and

polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, dementia, obsessive compulsive disorder, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The protein product of this gene may also show utility in the detection, treatment, and/or prevention of a variety of pulmonary disorders, particularly those related to disorders of the mucosal or endothelial tissues. The expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:16 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1225 of SEQ ID NO:16, b is an integer of 15 to 1239, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:16, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 7

The gene encoding the disclosed cDNA is believed to reside on chromosome 17. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 17. In specific embodiments, polypeptides of the invention

5 comprise the following amino acid sequence:

GAWGVEVVAVGSKAGCLVYQLCDLKQITFFFRASVCLSV (SEQ ID NO:314),
PASLGSSWGQKLRGGTRKSFQELSPSSAPPACLPQPPASTWLSSWPRPPCW
PPMCSWALGXCFPATGQWLPTSCCLWWCPDAGGRQKHFRSRWXTSWETW
QPYLTGLISSVLRAXPDSYLQFRSLXQXXLCCAFVIALGGGCFLLTALYLER
10 DETRAWQXVTGTPDSNDVDSNDLERQGLLSGXGASTEER (SEQ ID NO:315), L
RGGTRKSFQELSPSSAPPACLPQPP (SEQ ID NO:316), ATGQWLPTSCCLW
WCPDAGGRQKHFRSR (SEQ ID NO:317), GGCFLLTALYLERDETRAWQXV
(SEQ ID NO:318), APHLRLQPACHSPLPLPGSRPGPDHPAGLLCVPGPWGX
ASVLQLGSGCRHPAVCGGAQMPGDGRSTSDHGGXHPGXPGSPISQDLSLVSC
15 GPXALTPICSASAAXXXXXCAAPLSSPWGAAASC (SEQ ID NO:319),
PACHSPLPLPGSRPGPDH PAGLLCV (SEQ ID NO:320), and/or
SGCRHPAVCGGAQMPGDGRSTSDHGG (SEQ ID NO:321). Polynucleotides
encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in pineal gland and thymus.

20 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune, endocrine, emotional or behavior disorders, in addition to autoimmune diseases. Similarly, polypeptides and antibodies directed to these

25 polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, endocrine, hematopoietic, neural, and cancerous and wounded tissues) or bodily fluids

30 (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
35 NO:131 as residues: Asp-18 to Gln-27, Arg-44 to Asn-49.

The tissue distribution in thymus indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of

immune and autoimmune diseases, such as lupus, neutropenia, transplant rejection, and inflammatory diseases. Moreover, the expression within pineal gland indicates the protein product of this gene may be useful in disorders associated with biological clock aberrations, emotional distress, lethargy, or metabolic conditions. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:17 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1391 of SEQ ID NO:17, b is an integer of 15 to 1405, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:17, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 8

When tested against K562 cell lines, supernatants removed from cells containing this gene activated the ISRE (interferon-sensitive responsive element) promoter element. Thus, it is likely that this gene activates leukemia cells, or more generally, immune or hematopoietic cells, through the JAK-STAT signal transduction pathway. ISRE is a promoter element found upstream in many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

GLKVMELCSLTFLEATNLQSRCQQAMLPLKALRKNPFLLLPSFDGCCQSLA
FPGLWLQHSNLCNLHHMTFLVYLLCVSVFVKYFFPFSCITYTSHWI (SEQ ID
NO:322), ICSLTFLEATNLQSRCQQAMLP (SEQ ID NO:323), and/or GLWLQHS
NLCLNHHMTFLVYLLCVSV (SEQ ID NO:324). Polynucleotides encoding these
polypeptides are also encompassed by the invention.

This gene is expressed primarily in IL-1 and LPS induced neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly inflammation. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:132 as residues: Ser-45 to His-50, His-52 to Ile-57, Lys-67 to His-81.

The tissue distribution in neutrophils, combined with the detected ISRE biological activity indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of inflammatory disorders, such as psoriasis, inflammatory bowel disease, rheumatoid arthritis, and sepsis. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:18 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1520 of SEQ ID NO:18, b is an integer of 15 to 1534, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:18, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 9

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: PFLLPPKRRGLLYHLLIQKSTLGLVWVFREHLDSRSQ (SEQ ID NO:325), RGXPSWPMHTLVYAQHSTHTPLIQPQWTQVIDQPPGITHQFCVR XCXCPTLESCVQECVTRSRXKPTTGVPGPQRLA (SEQ ID NO:326), TPLIQPQW TQVIDQPPGITHQFCV (SEQ ID NO:327), ALGPSQTCDLVDWLVAKPSFFRGPPQ GIHYFSLWRRKPLSHWVSIWQLQGQETMPAMLRSPAGQATVATGPPRGSPS PQDLPSYHRKQVESSHRHSWEPASQSQ (SEQ ID NO:328), CDLDVWLVAKPSF FRGPQGIHYFSLWRR (SEQ ID NO:329), and/or AGQATVATGPPRGSPSPQDLPSYHRKQV (SEQ ID NO:330). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in synovial fibroblasts, and to a lesser extent, in endothelial cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, skeletal or vascular disorders, particularly arthritis. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the skeletal system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., skeletal, vascular, endothelial, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in synovial fibroblasts indicates polynucleotides and polypeptides corresponding to this gene are useful for treatment of arthritis. Moreover, polynucleotides and polypeptides corresponding to this gene are useful in the detection

and treatment of disorders and conditions afflicting the skeletal system, in particular osteoporosis, bone cancer, as well as, disorders afflicting connective tissues (e.g. arthritis, trauma, tendonitis, chondromalacia and inflammation), such as in the diagnosis or treatment of various autoimmune disorders such as rheumatoid arthritis, lupus, scleroderma, and dermatomyositis as well as dwarfism, spinal deformation, and specific joint abnormalities as well as chondrodysplasias (i.e. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). The protein product of this gene may also be useful for the detection, treatment, and/or prevention of a variety of vascular disorders which include, but are not limited to, atherosclerosis, embolism, stroke, microvascular disease, or aneurysm. The protein may also be useful in the treatment of integumentary disorders, particularly those related to aberrations in the extracellular matrix or lamina. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:19 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1219 of SEQ ID NO:19, b is an integer of 15 to 1233, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:19, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 10

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

XGDTXTQNSRHDTPXLIDYYRESCTLQYRPEFPGRPTRPRGSCPQYPGPAIPRT
SWALGEGDAAPRGAAH PRRADVPLG (SEQ ID NO:331), YRESCTLQYRPEFPG
RPTRPRGSCPQYPGP (SEQ ID NO:332), GKLYAAVPSGIPGSTHASARLMPPVS
RSSYSEDIVGSRRRRRSSSGSPSPQSRCSSWDGCSRSHSRGREGXRPPWSEL
DVGALYPFSRSGSRGRLPRFRNYAFASSWSTSYSGYRYHRALLCRRTAVSGR
LREGREPSAEEAEGEREDWGIGSA (SEQ ID NO:333), SGIPGSTHASARLMPP

VSRSSYS (SEQ ID NO:334), GCSRSHSRGREGXRPPWSELDVGALYPFS (SEQ ID NO:335), TAVSGRLREGREPSAEEAEGEREDW (SEQ ID NO:336), RIRKAA VQIPTRKNIGXRRPVVQETRKKERISRLKESIGNILIVTVTQSLTQILTLMMI KRELKPRRKRRKRNTKQXKRRIRKPKKNPVTQAVKTQKRTCQKLPGMEQ
5 PNVADTMDLIGPEAPINTYLFKMKNL (SEQ ID NO:337), TRKKERISRLKESI GNILIVTVTQSLTQ (SEQ ID NO:338), and/or VKTQKRTCQKLPGMEQPNVA DTMDLIGP (SEQ ID NO:339). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 6. Accordingly, polynucleotides related to this invention are
10 useful as a marker in linkage analysis for chromosome 6.

This gene is expressed primarily in retina.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
15 not limited to, visual disorders, particularly retinopathy. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the ocular system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell
20 types (e.g., cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, vitreous humor, aqueous humor, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

25 The tissue distribution in retina indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of diseases of the retina, for example, diabetic retinopathy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

30 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:20 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

35 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1076 of SEQ ID NO:20, b is an integer of 15

to 1090, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:20, and where b is greater than or equal to a + 14.

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FEATURES OF PROTEIN ENCODED BY GENE NO: 11

When tested against NIH3T3 cell lines, supernatants removed from cells containing this gene activated the EGR1 (early growth response gene 1) promoter element. Thus, it is likely that this gene activates fibroblast cells, or more generally, other cells of the integumentary system, through the EGR1 signal transduction pathway. EGR1 is a separate signal transduction pathway from Jak-STAT. Genes containing the EGR1 promoter are induced in various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

LPFTLKPKMVKIPFSSRLINNNLQYIDCILSLKRCEEILLMWHGLLLCLASVFLE
LRGDRPPLLASLLEPHKMPLHSSSL (SEQ ID NO:340), LKPKMVKIPFSSRLIN
NNLQYIDC (SEQ ID NO:341), SLKRCEEILLMWHGLLLCLASVF (SEQ ID
NO:342), LRGDRPPLLASLLEPHKMPLH (SEQ ID NO:343), LQMHTGSGFKGK
SCEVAFYVAQAEPGEGAYLHGAQETQKQGIEADHATLRGSPHSVSKTKYNLY
IANYYLLAWRKMES (SEQ ID NO:344), CEVAFYVAQAEPGEGAYLH (SEQ ID
NO:345), and/or ATLRGSPHSVSKTKYNLYIANYY (SEQ ID NO:346).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in human ovarian cancer.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive disorders, particularly cancers, such as ovarian cancer.

Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the female reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the

expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in human ovarian cancer tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of ovarian cancer. Moreover, the expression within cellular sources marked by proliferating cells indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:21 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 668 of SEQ ID NO:21, b is an integer of 15 to 682, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:21, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 12

Contact of cells with supernatant expressing the product of this gene increases the permeability of the plasma membrane of myeloid leukemia cells to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product binds a receptor on the surface of immune or hematopoietic cells, in addition to other cells or cell types. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating myeloid cells. Binding of a ligand to a receptor is known to alter intracellular levels of small molecules, such as calcium, potassium and sodium, as well as alter pH and membrane potential. Alterations in small molecule concentration can be measured to identify supernatants which bind to receptors of a particular cell. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

LSASLLDRYPASESNNYIFNFVLYMLHFLAGTLFSLFPDFELSPRSATLFPDLR
 TVQLSSRPHL (SEQ ID NO:347), LLDRYPASESNNYIFNFVLYMLH (SEQ ID
 NO:348), FPDFELSPRSATLFPDLRTV (SEQ ID NO:349), NGGFYDVFSKQAG
 LIEFLCIIFYPMAHVICGSRTIVRTIPVHYVGEYFIKSSIWILYRINERTATKK
 5 AASDFQKNFRCFLDAF (SEQ ID NO:350), KQAGLIEFLCIIFYPMAH (SEQ ID
 NO:351), and/or YFIKSSIWILYRINERTATKKAA (SEQ ID NO:352).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in anergic T-cells.

Therefore, polynucleotides and polypeptides of the invention are useful as
 10 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, immune or hematopoietic disorders, particularly immunodeficiencies and
 inflammatory disorders. Similarly, polypeptides and antibodies directed to these
 polypeptides are useful in providing immunological probes for differential identification
 15 of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells,
 particularly of the immune system, expression of this gene at significantly higher or
 lower levels may be routinely detected in certain tissues or cell types (e.g., immune,
 hematopoietic cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum,
 plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken
 20 from an individual having such a disorder, relative to the standard gene expression
 level, i.e., the expression level in healthy tissue or bodily fluid from an individual not
 having the disorder.

The tissue distribution in anergic T-cells, combined with the detected calcium
 flux biological activity, indicates polynucleotides and polypeptides corresponding to
 25 this gene are useful for the diagnosis and treatment of immune disorders, particularly
 those involving anergic T-cells. Moreover, the secreted protein can also be used to
 determine biological activity, to raise antibodies, as tissue markers, to isolate cognate
 ligands or receptors, to identify agents that modulate their interactions, and as
 nutritional supplements. It may also have a very wide range of biological activities.
 30 Typical of these are cytokine, cell proliferation/differentiation modulating activity or
 induction of other cytokines; immunostimulating/immunosuppressant activities (e.g. for
 treating human immunodeficiency virus infection, cancer, autoimmune diseases and
 allergy); regulation of hematopoiesis (e.g. for treating anaemia or as adjunct to
 chemotherapy); stimulation or growth of bone, cartilage, tendons, ligaments and/or
 35 nerves (e.g. for treating wounds, stimulation of follicle stimulating hormone (for
 control of fertility); chemotactic and chemokinetic activities (e.g. for treating infections,
 tumors); hemostatic or thrombolytic activity (e.g. for treating haemophilia, cardiac

infarction etc.); anti-inflammatory activity (e.g. for treating septic shock, Crohn's disease); as antimicrobials; for treating psoriasis or other hyperproliferative diseases; for regulation of metabolism, and behaviour. Also contemplated is the use of the corresponding nucleic acid in gene therapy procedures. Protein, as well as, antibodies
5 directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:22 and may have been publicly available prior to conception of the present
10 invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 756 of SEQ ID NO:22, b is an integer of 15 to
15 770, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:22, and where b is greater than or equal to a + 14.

20 FEATURES OF PROTEIN ENCODED BY GENE NO: 13

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: SPRXGRXFXTSRKQISGFLEFD (SEQ ID NO:353).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in bone marrow.

25 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly leukemia or multiple myeloma. Similarly, polypeptides and antibodies directed to these polypeptides are
30 useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine,
35 synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the

expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in bone marrow tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of some types of leukemia, and other disorders involving bone marrow tissues or cells. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:23 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 551 of SEQ ID NO:23, b is an integer of 15 to 565, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:23, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 14

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: MKHAAFGLIPLVKEIYRYLKI KSKLLIGSGKCQLQPEWL QTS LNSSLLMDWLTPY (SEQ ID NO:354), IYRYLKI KSKLLIGSGKCQLQPE WLQ TSL (SEQ ID NO:355), QLGLPWDQSKGPRKNGLSMCGSVYSTIWSLIA SRREETIRVIVLYIQSPNINTRHISKRGLNKALTNP (SEQ ID NO:356), SKGPR

KNGLSMCGSVYSTIWS (SEQ ID NO:357), and/or QSPNINTRHISKRGLNK (SEQ ID NO:358). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in adult retina, and to a lesser extent, in 12 week old early stage human.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, visual or developmental disorders, particularly retinopathy. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the ocular system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., visual, developmental cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, amniotic fluid, aqueous humor, vitreous humor, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in human retina indicates polynucleotides and polypeptides corresponding to this gene are useful for treatment of retinopathy, and other disorders involving the visual system. Moreover, the expression within embryonic tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:24 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1342 of SEQ ID NO:24, b is an integer of 15

to 1356, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:24, and where b is greater than or equal to a + 14.

5 FEATURES OF PROTEIN ENCODED BY GENE NO: 15

The translation product of this gene has homology to the conserved human non-differentiated blood cell tyrosine kinase receptor fragment (See Genbank Accession No. R76466) which is thought to be important in signalling essential cellular pathways. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: HPQTSAGGFPLHQGLPTVS (SEQ ID NO:359), PSWFPELSPWPLKTL KKRRQMRLRRRGRLCRLSPATTTTADTCRCPARSYRGSGRRPACAQDSPAPPS RPTTRAWWEKCALRPKRAAQWSTGVPPSPRSSTTGCCFGTAAXCAEGARR (SEQ ID NO:360), TTTADTCRCPARSYRGSGRRPA (SEQ ID NO:361), and/or PSRPTRRAWWEKCALRPKRAAQWST (SEQ ID NO:362). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in human fetal epithelium.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, developmental, integumentary, immune, or hematopoietic disorders, particularly skin cancer. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the integumental system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., developmental, integumentary, immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:139 as residues: Gln-26 to Ala-39, Cys-48 to His-55.

The tissue distribution in human fetal epithelium, combined with the homology to a conserved tyrosine kinase receptor, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of skin cancer, or other disorders related to the integument, particularly proliferative

conditions. Similarly, polynucleotides and polypeptides corresponding to this gene are useful for the treatment, diagnosis, and/or prevention of various skin disorders including congenital disorders (i.e. nevi, moles, freckles, Mongolian spots, hemangiomas, port-wine syndrome), integumentary tumors (i.e. keratoses, Bowen's disease, basal cell carcinoma, squamous cell carcinoma, malignant melanoma, Paget's disease, mycosis fungoides, and Kaposi's sarcoma), injuries and inflammation of the skin (i.e. wounds, rashes, prickly heat disorder, psoriasis, dermatitis), atherosclerosis, urticaria, eczema, photosensitivity, autoimmune disorders (i.e. lupus erythematosus, vitiligo, dermatomyositis, morphea, scleroderma, pemphigoid, and pemphigus), keloids, striae, erythema, petechiae, purpura, and xanthelasma. In addition, such disorders may predispose increased susceptibility to viral and bacterial infections of the skin (i.e. cold sores, warts, chickenpox, molluscum contagiosum, herpes zoster, boils, cellulitis, erysipelas, impetigo, tinea, athlete's foot, and ringworm). Moreover, the protein product of this gene may also be useful for the treatment or diagnosis of various connective tissue disorders such as arthritis, trauma, tendonitis, chondromalacia and inflammation, autoimmune disorders such as rheumatoid arthritis, lupus, scleroderma, and dermatomyositis as well as dwarfism, spinal deformation, and specific joint abnormalities as well as chondrodysplasias (i.e. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:25 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 603 of SEQ ID NO:25, b is an integer of 15 to 617, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:25, and where b is greater than or equal to a + 14.

35 FEATURES OF PROTEIN ENCODED BY GENE NO: 16

When tested against PC12 cell lines, supernatants removed from cells containing this gene activated the EGR1 (early growth response gene 1) pathway. Thus, it is likely that this gene activates sensory neuron cells, or generally other cells or cell types, particularly immune cells, through the EGR1 signal transduction pathway. EGR1 is a separate signal transduction pathway from Jak-STAT, genes containing the EGR1 promoter are induced in various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

ARGVLNLRNRFECFSIIETV (SEQ ID NO:363), IGQLVMKSICHFQRLLSVAI
DFASQFLKNYIFSSTHSSKAGFSVVCSLPKWLYTDGMEMVLKITHKLSF (SEQ
ID NO:364), and/or QRLLSVAIDFASQFLKNYIFSSTH (SEQ ID NO:365).

Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 8. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 8.

This gene is expressed primarily in fetal liver, and to a lesser extent, in resting T-cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune, hematopoietic, or hepatic disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, hepatic, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, amniotic fluid, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in fetal liver and resting T-cells, combined with the detected EGR1 biological activity indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of immune disorders involving T-cells, and more generally, hematopoietic conditions. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia.

pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Additionally, expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:26 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 634 of SEQ ID NO:26, b is an integer of 15 to 648, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:26, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 17

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: LMKTASRMLLLE (SEQ ID NO:366). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in CD34-positive T cells from cord blood, and to a lesser extent, in anergic T cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a

biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly in immune system maturation and hematopoietic development. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:141 as residues: Ile-46 to Tyr-56.

The tissue distribution in CD34-positive T cells and anergic T cells. indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of diseases involving hematopoietic development and stem cell maturation, including protection of stem cells from chemotherapy, immunosuppression during transplant rejection, and neutropenia. Moreover, this gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:27 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1374 of SEQ ID NO:27, b is an integer of 15 to 1388, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:27, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 18

When tested against U937 and Jurket cell lines, supernatants removed from cells containing this gene activated the GAS (gamma activating sequence) pathway. Thus, it is likely that this gene activates myeloid and T-cells, or more generally cells of immune or hematopoietic origin, through the JAK-STAT signal transduction pathway. GAS is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ATXWDXPGCRNSARGERLHVGDAPW (SEQ ID NO:367), ARDER REVLKTLMLSTQRPQAFLPSQSWFVRLQKAGEGALKQENSLTIQNCLLCL PRVHRQRPTPPQPQRGNTEASVLQTSTEHLPRAAVLLVPNSCSPGXPTXLLSS (SEQ ID NO:368), ERREVLKTLMLSTQRPQAFLP (SEQ ID NO:369), GALKQEN SLTIQNCLLCLPRVHRQR (SEQ ID NO:370), and/or SVLQTSTEHLPRAAVLLVP NS (SEQ ID NO:371). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in activated human neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, such as neutropenia. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing

immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic cancerous and wounded
5 tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
10 NO:142 as residues: Val-25 to Gly-33.

The tissue distribution in activated neutrophils, combined with the detected GAS biological activity, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of immune disorders involving neutrophils. Moreover, this gene product may be involved in the regulation of
15 cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS,
20 leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus
25 erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or
30 immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:28 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the
35 scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of

a-b, where a is any integer between 1 to 602 of SEQ ID NO:28, b is an integer of 15 to 616, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:28, and where b is greater than or equal to a + 14.

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FEATURES OF PROTEIN ENCODED BY GENE NO: 19

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ALVISNPLL (SEQ ID NO:372), PYINTQMCVSSRNKFCISG
 10 HQKYDSHGRETRFEMHKARASSWKNILKIRSLKIISRGFEITNA (SEQ ID NO:373), KFCISGHQKYDSHGRETRFEMHKARAS (SEQ ID NO:374), HTLLEI ANPLQAAVLGASSIHPSIHTSTHLMFMGLKWTELHHSPDSVQGAGAAEAAQTR HSLRPGRGRERHDCTLKNLTLFIIC (SEQ ID NO:375), NPLQAAVLGASSIHPSIHTSTH (SEQ ID NO:376), and/or SLRPGRGRERHDCTLKN (SEQ ID NO:377).
 15 Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
 20 not limited to, immune or hematopoietic disorders, such as neutropenia, inflammatory, or allergic conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or
 25 lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an
 30 individual not having the disorder.

The tissue distribution in neutrophils indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of immune disorders involving neutrophils, or more generally, immune or hematopoietic disorders. Moreover, the expression of this gene product indicates a role in the
 35 regulation of the proliferation; survival; differentiation; and/or activation of hematopoietic cell lineages, including blood stem cells. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other

processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:29 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 814 of SEQ ID NO:29, b is an integer of 15 to 828, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:29, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 20

This gene is expressed primarily in 7 week old early stage human.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, fetal or developmental abnormalities, particularly congenital defects, including metabolic conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells,

particularly of the developmental systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., developmental, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in 7 week old early stage human tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of fetal abnormalities. Expression within embryonic tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Furthermore, the protein is useful in the diagnosis, prevention, and/or treatment of various metabolic disorders such as Tay-Sachs disease, phenylketonuria, galactosemia, hyperlipidemias, porphyrias, leukemias, or Hurler's syndrome. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:30 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 567 of SEQ ID NO:30, b is an integer of 15 to 581, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:30, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 21

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:
AENVHCTPAWETGRDSEDGKGREGMGRDRKGWDGTGLDGTGWEGKRERNV

PA (SEQ ID NO:378), GRDSEDGKGREGMGRDRKGWDGTGLD (SEQ ID NO:379), TSLGDLWDYNNSSH (SEQ ID NO:380), DRRIIRTREAAVAVSRERP LHSSLGNRERLRRWEGTGRDGKGQEGMGRDGTGWDGMGREERKKCPS (SEQ ID NO:381), RPLHSSLGNRERLRRWEGTGRDGKG (SEQ ID NO:382),
 5 NQSWGPMGL (SEQ ID NO:383), GGGGCSEPRTSIALQPGKQGETPKMGRD GKGWEGTGRDGTGRDWMGRDGKGREKEMSQQ (SEQ ID NO:384), KQGE TPKMGRDGKGWEGTGRDGTG (SEQ ID NO:385), and/or PVLGTYGTITTPV TELTKGQEKEGGVETVLYE (SEQ ID NO:386). Polynucleotides encoding these polypeptides are also encompassed by the invention.

10 This gene is expressed primarily in frontal cortex from a patient suffering from schizophrenia.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
 15 not limited to, neural disorders, such as Schizophrenia. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain
 20 tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

25 The tissue distribution in frontal cortex tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of some central nervous system disorders, for example, schizophrenia. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioural disorders, or
 30 inflammatory conditions such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning
 35 disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural

function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Moreover, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, sexually-linked disorders, or disorders of the cardiovascular system. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:31 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 775 of SEQ ID NO:31, b is an integer of 15 to 789, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:31, and where b is greater than or equal to a + 14.

20 FEATURES OF PROTEIN ENCODED BY GENE NO: 22

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: KIVFIDQKWSK (SEQ ID NO:387), CSLFWGILFLSRLRIH LFLSLKPCMCLRPIDILSHFLDIFVTSVLSELEKSSLKTTTETFSFAVFLLLMMN (SEQ ID NO:388), LSRLRIHLFLSLKPCMCLRPIDILSH (SEQ ID NO:389), and/or VLSELEKSSLKTTTETFSFAVFL (SEQ ID NO:390). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in thymus and neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly inflammation, or disorders related to immune cell maturation and/or activation. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain

tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:146 as residues: Lys-38 to Leu-46.

The tissue distribution in thymus and neutrophils indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of inflammatory disorders, such as psoriasis, inflammatory bowel disease, rheumatoid arthritis, and sepsis. Moreover, the expression of this gene product indicates a role in regulating the proliferation; survival; differentiation; and/or activation of hematopoietic cell lineages, including blood stem cells. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:32 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 870 of SEQ ID NO:32, b is an integer of 15 to

884, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:32, and where b is greater than or equal to a + 14.

5 FEATURES OF PROTEIN ENCODED BY GENE NO: 23

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: TLFYILH (SEQ ID NO:391). Polynucleotides encoding these polypeptides are also encompassed by the invention.

10 This gene is expressed primarily in bone marrow.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, diseases and disorders afflicting blood cells. Similarly, polypeptides and
15 antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the hematopoietic system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or
20 bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
25 NO:147 as residues: Pro-30 to Asn-36.

The tissue distribution in bone marrow indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of diseases afflicting the blood, including leukemia, neutropenia, anemia, and stem cell protection during chemotherapy. Moreover, polynucleotides and
30 polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or
35 chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the

expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

- 5 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:33 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.
- 10 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 852 of SEQ ID NO:33, b is an integer of 15 to 866, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:33, and where b is greater than or equal to a + 14.

15

FEATURES OF PROTEIN ENCODED BY GENE NO: 24

This gene is expressed primarily in Merkel cells.

- 20 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, integumentary disorders, particularly aberrations in mechanosensory function. Similarly, polypeptides and antibodies directed to these polypeptides are
- 25 useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly in tissues involved in sensory function, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., integumentary, sensory, and cancerous and wounded tissues) or bodily fluids (e.g.,
- 30 lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

- 35 The tissue distribution in Merkel cells indicates polynucleotides and polypeptides corresponding to this gene are useful for Merkel cell dysfunctions, which may include aberrations in sensory function. Alternatively, polynucleotides and polypeptides corresponding to this gene are useful for the treatment, diagnosis, and/or

prevention of various skin disorders including congenital disorders (i.e. nevi, moles, freckles, Mongolian spots, hemangiomas, port-wine syndrome), integumentary tumors (i.e. keratoses, Bowen's disease, basal cell carcinoma, squamous cell carcinoma, malignant melanoma, Paget's disease, mycosis fungoides, and Kaposi's sarcoma),
5 injuries and inflammation of the skin (i.e. wounds, rashes, prickly heat disorder, psoriasis, dermatitis), atherosclerosis, urticaria, eczema, photosensitivity, autoimmune disorders (i.e. lupus erythematosus, vitiligo, dermatomyositis, morphea, scleroderma, pemphigoid, and pemphigus), keloids, striae, erythema, petechiae, purpura, and xanthelasma. In addition, such disorders may predispose increased susceptibility to
10 viral and bacterial infections of the skin (i.e. cold sores, warts, chickenpox, molluscum contagiosum, herpes zoster, boils, cellulitis, erysipelas, impetigo, tinea, athlete's foot, and ringworm). Moreover, the protein product of this gene may also be useful for the treatment or diagnosis of various connective tissue disorders such as arthritis, trauma, tendonitis, chondromalacia and inflammation, autoimmune disorders such as
15 rheumatoid arthritis, lupus, scleroderma, and dermatomyositis as well as dwarfism, spinal deformation, and specific joint abnormalities as well as chondrodysplasias (i.e. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets
20 for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:34 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the
25 scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1680 of SEQ ID NO:34, b is an integer of 15 to 1694, where both a and b correspond to the positions of nucleotide residues shown
30 in SEQ ID NO:34, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 25

35 The translation product of this gene shares sequence homology with dihydropyridine receptor or nitrate transporter which are thought to be important in transport of small molecules across the cell membrane. In specific embodiments,

polypeptides of the invention comprise the following amino acid sequence:
GTSFSVLSLIHDTG (SEQ ID NO:392). Polynucleotides encoding these polypeptides
are also encompassed by the invention. The gene encoding the disclosed cDNA is
believed to reside on chromosome 11. Accordingly, polynucleotides related to this
5 invention are useful as a marker in linkage analysis for chromosome 11.

This gene is expressed primarily in kidney cortex and muscle tissue from a
patient with multiple sclerosis, and to a lesser extent, in fetal liver/spleen.

Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
10 biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, muscle, urogenital, or renal disorders, particularly musculodegenerative
conditions such as multiple sclerosis, in addition to kidney or metabolic disorders and
diseases. Similarly, polypeptides and antibodies directed to these polypeptides are
useful in providing immunological probes for differential identification of the tissue(s)
15 or cell type(s). For a number of disorders of the above tissues or cells, particularly of
the multiple sclerosis and renal system, expression of this gene at significantly higher or
lower levels may be routinely detected in certain tissues or cell types (e.g., muscle,
urogenital, renal, hepatic, metabolic, immune, hematopoietic, and cancerous and
wounded tissues) or bodily fluids (e.g., lymph, serum, bile, amniotic fluid, plasma,
20 urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an
individual having such a disorder, relative to the standard gene expression level, i.e.,
the expression level in healthy tissue or bodily fluid from an individual not having the
disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
25 NO:149 as residues: Ala-66 to Leu-73.

The tissue distribution in kidney cortex and muscle tissue, combined with the
homology to small molecule transporters indicates polynucleotides and polypeptides
corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
disorders of renal functions and muscular diseases, including multiple sclerosis,
30 muscular dystrophy, cardiomyopathy, fibroids, myomas, and rhabdomyosarcomas.
The tissue distribution in kidney indicates that this gene or gene product could be used
in the treatment and/or detection of kidney diseases including renal failure, nephritis,
renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis,
nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and
35 kidney stones, in addition to Wilm's Tumor Disease, and congenital kidney
abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome.
Protein, as well as, antibodies directed against the protein may show utility as a tumor

marker and/or immunotherapy targets for the above listed tissues. The secreted protein can also be used to determine biological activity, to raise antibodies, as tissue markers, to isolate cognate ligands or receptors, to identify agents that modulate their interactions and as nutritional supplements. It may also have a very wide range of biological activities. Typical of these are cytokine, cell proliferation/differentiation modulating activity or induction of other cytokines; immunostimulating/immunosuppressant activities (e.g. for treating human immunodeficiency virus infection, cancer, autoimmune diseases and allergy); regulation of hematopoiesis (e.g. for treating anemia or as adjunct to chemotherapy); stimulation or growth of bone, cartilage, tendons, ligaments and/or nerves (e.g. for treating wounds, stimulation of follicle stimulating hormone (for control of fertility); chemotactic and chemokinetic activities (e.g. for treating infections, tumors); hemostatic or thrombolytic activity (e.g. for treating hemophilia, cardiac infarction etc.); anti-inflammatory activity (e.g. for treating septic shock, Crohn's disease); as antimicrobials; for treating psoriasis or other hyperproliferative diseases; for regulation of metabolism, and behavior. Also contemplated is the use of the corresponding nucleic acid in gene therapy procedures. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. .

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:35 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1201 of SEQ ID NO:35, b is an integer of 15 to 1215, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:35, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 26

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

VLISASTIGSRTSGAQGMEKMTIPTLAVGEPKTPEKSKCSLKQCFSSCNVHIDH
LGLLLKCKF (SEQ ID NO:393), ASTIGSRTSGAQGMEKMTIPTLA (SEQ ID

NO:394), and/or GEPKTPEKSKCSLKQCFSSCNVHIDHL (SEQ ID NO:395). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in kidney medulla.

Therefore, polynucleotides and polypeptides of the invention are useful as
5 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, renal, urogenital, or more generally, disorders afflicting endothelial tissues. Similarly, polypeptides and antibodies directed to these polypeptides are useful
10 in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the renal system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., renal, urogenital, endothelial, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual
15 having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in kidney medulla indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or
20 prevention of renal disorders, including lesions, vascular diseases, hydronephrosis, and renal diseases associated with systemic disorders. Moreover, the gene or gene product could be used in the treatment and/or detection of kidney diseases including renal failure, nephritis, renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome,
25 glomerulonephritis, hematuria, renal colic and kidney stones, in addition to Wilm's Tumor Disease, and congenital kidney abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome. The protein product can also be used for the treatment, detection, and/or prevention of various endothelial disorders, which include microvascular disease, embolism, aneurysm, stroke, or atherosclerosis.
30 Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ
ID NO:36 and may have been publicly available prior to conception of the present
35 invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1780 of SEQ ID NO:36, b is an integer of 15 to 1794, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:36, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 27

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

10 RIRSQDLAIMTTCFKKYEFSFFVLGFLRRWGATLCLGFTSFAIKFHPSSLCSEKE
 GKDFSGFALSIGHPERKKEEGWARWLTPVVPVLWEAEVGGSPVSS (SEQ ID
 NO:396), TTCFKKYEFSFFVLGFLRRWGA (SEQ ID NO:397), SEKEGKDFSGF
 ALSIGHPERKKEEGW (SEQ ID NO:398), MNECIAKPCMAAFCSCPSCCLPSR
 15 PGCSREQRCAFSCEPCHTVEHWVEPMGQGQRQEHTQGSVLPSSHPSRGKATT
 VHSCCQEPWG (SEQ ID NO:399), FCSCPSCCLPSRPGCSREQRCAFSCEP (SEQ
 ID NO:400), GQRQEHTQGSVLPSSHPSRGKAT (SEQ ID NO:401), GVVNSCLL
 PLPPRLLATGMDCGGFASRRMGGRQHAALSVFLPLPLAHGLYPMFNCVAGLT
 GKGTSLLSGAARPAGEAAARAGTKGSHARFGNAFIHSFHSFIECLLNTYCV
 20 SSALTAVGIGDILKNKNDKSSCLCSC (SEQ ID NO:402), GMDCGGFASRRMG
 GRQHAALSVFLP (SEQ ID NO:403), LTGKGTSLLSGAARPAGEAAARAGT (SEQ
 ID NO:404), and/or LNTYCVPSALTAVGIGDILKN (SEQ ID NO:405).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in fetal lung.

25 Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, pulmonary or developmental disorders and/or diseases. Similarly,
 polypeptides and antibodies directed to these polypeptides are useful in providing
 30 immunological probes for differential identification of the tissue(s) or cell type(s). For a
 number of disorders of the above tissues or cells, particularly of the pulmonary system,
 expression of this gene at significantly higher or lower levels may be routinely detected
 in certain tissues or cell types (e.g., pulmonary, developmental, and cancerous and
 wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, pulmonary surfactant
 35 or sputum, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken
 from an individual having such a disorder, relative to the standard gene expression

level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in fetal lung indicates polynucleotides and polypeptides corresponding to this gene are useful for diagnosis and intervention of diseases related to pulmonary functions and infections. Moreover, the expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:37 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1160 of SEQ ID NO:37, b is an integer of 15 to 1174, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:37, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 28

This gene is expressed primarily in hepatocellular tumors.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, metabolic or hepatic disorders or diseases, particularly hepatocellular tumors. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the liver, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., metabolic, hepatic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, bile, plasma, urine, synovial fluid and

spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

5 The tissue distribution in hepatocellular tumors indicates polynucleotides and polypeptides corresponding to this gene are useful for diagnosis and treatment of hepatic disorders, particularly proliferative conditions such as hepatocellular tumors. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection and treatment of liver disorders and cancers (e.g. hepatoblastoma, jaundice, hepatitis, liver metabolic diseases and conditions that are attributable to the
10 differentiation of hepatocyte progenitor cells). In addition, the protein may play a role in the treatment, detection, and/or prevention of developmental abnormalities, fetal deficiencies, pre-natal disorders and various wound-healing models and/or tissue trauma. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

15 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:38 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.
20 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1073 of SEQ ID NO:38, b is an integer of 15 to 1087, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:38, and where b is greater than or equal to a + 14.

25

FEATURES OF PROTEIN ENCODED BY GENE NO: 29

30 The translation product of this gene has homology to a contains a helix-loop-helix motif from a *Caenorhabditis elegans* protein (See Genbank Accession No. gil1326280) which is thought to function as a modulator of gene expression. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:
35 TSLSQLWHFCHFVWPVKFCCGGCPVHCRMFSISGLYLLNASAPSLQLNDPKCLQT (SEQ ID NO:406), and/or WPVKFCCGGCPVHCRMFSISGLYLLNA (SEQ ID NO:407). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in normal breast.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, or endocrine disorders, particularly of the breast, such as breast cancer. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the cancer and metabolic systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, endocrine, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, breast milk, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in breast indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of some types of breast cancer. The protein can also be used for the treatment, detection, and/or prevention of disorders related to ductile tissues or cell types, particularly secretory dysfunctions. The protein can also be used for the treatment of vascular disorders such as atherosclerosis, microvascular disease, embolism, stroke, or aneurysm. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:39 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 424 of SEQ ID NO:39, b is an integer of 15 to 438, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:39, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 30

When tested against K562 cell lines, supernatants removed from cells containing this gene activated the ISRE (interferon-sensitive responsive element) promoter element. Thus, it is likely that this gene activates leukemia cells, or potentially other cells or cell-types, through the JAK-STAT signal transduction pathway. ISRE is a promoter element found upstream in many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: SCRCWALGAGGGQRQWVGRS (SEQ ID NO:408), TGAQAPKMGARQRKRPLQTRIKNSSKSTLWPPQWVRCGRWWTWPSRKKTSRPRRQLFTSTLSTSASALVWPVSWFSQEGH (SEQ ID NO:409), MGARQRKRPLQTRIKNSSKSTLWPP (SEQ ID NO:410), and/or PRRQLFTSTLSTSASALVWPVSW (SEQ ID NO:411). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in human testes.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive disorders, particularly abnormalities of the testes. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, testicular, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, seminal fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:154 as residues: Leu-26 to Glu-52, Gln-71 to Lys-79.

The tissue distribution in testes, combined with the detected ISRE biological activity, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of abnormalities of the testes, such as male infertility and proliferative conditions. and/or could be used as a male

contraceptive. The protein can also be used for the maintenance normal testicular function. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:40 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 720 of SEQ ID NO:40, b is an integer of 15 to 734, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:40, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 31

This gene is expressed primarily in colon, and to a lesser extent, in thymus.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, gastrointestinal, immune, or hematopoietic disorders, particularly abnormalities of the colon, and cancers. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the digestive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., gastrointestinal, immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in colon and thymus tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of abnormalities of the colon. The protein can also be used for treating inflammatory conditions, or potentially in modulating immune system activation in the treatment of gastrointestinal disorders. Protein, as well as, antibodies directed against

the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:41 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1332 of SEQ ID NO:41, b is an integer of 15 to 1346, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:41, and where b is greater than or equal to a + 14.

15 FEATURES OF PROTEIN ENCODED BY GENE NO: 32

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: DGGGKEEGVSCLKISLLCGPWLWLP (SEQ ID NO:412), HE MGELAICHTRVPFSLPSSAQQGVPQNLQGPIGHLAVCTPSSLTSWHFPQKREKW
 20 STVNKRQRFLQFPAPLRNWIPQTPLSLSVSSGPLGSFTVFTLLSLCAWPWCCRD
 CYKSCCPIPIFNLTAPLCVHTPEPSS (SEQ ID NO:413), SSAQQGVPQNLQGPIGHLAVCTPS (SEQ ID NO:414), VNKRQRFLQFPAPLRNWIPQTPLSLSVS (SEQ ID NO:415), CCRDCYKSCCPIPIFNLTAPLCV (SEQ ID NO:416), DLNVTNEGEGKE
 25 VLGQGSTNNEKKKCQKATSNTEPRAREAKARHANMGTS DRESPTWSLTAE
 GLKAKSKMQGKATKGAASTMGSHNQGPHKREIFKHETPSSFPPPSQCQPE
 LLYKYWATLASGYVPSWLPSVDSYRINTAIKDKNGQDT (SEQ ID NO:417),
 VLGQGSTNNEKKKCQKATSNTEPRA (SEQ ID NO:418), RESPTWSLTAE
 GLKAKSKMQGKATKGAAS (SEQ ID NO:419), and/or GYVPSWLPSVDSYRI
 30 NTAIKDK (SEQ ID NO:420). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in rhabdomyosarcoma, and to a lesser extent in heart and thymus.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a
 35 biological sample and for diagnosis of diseases and conditions which include, but are not limited to, muscle disorders, particularly rhabdomyosarcoma and other proliferative conditions. Similarly, polypeptides and antibodies directed to these polypeptides are

useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the muscular system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., muscle, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID

NO:156 as residues: Gly-28 to Asp-33.

The tissue distribution in rhabdomyosarcoma tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of rhabdomyosarcoma. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection, treatment, and/or prevention of various muscle disorders, such as muscular dystrophy, cardiomyopathy, fibroids, or myomas. The protein can also be used for the amelioration of proliferative conditions in other tissues, including modulation of the immune response to such tissues. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:42 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 984 of SEQ ID NO:42, b is an integer of 15 to 998, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:42, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 33

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: NSAEQSMILVT (SEQ ID NO:421), RXDRXPVPELPGYEPT RTDISSFKNYRYAFDFARDKDKQRSLLDIDTAKSMLALLLGRTWPLFSVFYQYLE QSKYRVMNKDQWYNVLEFSRTVHADLSNYDEDGAWPVLLDEFVEWQKVRQT

S (SEQ ID NO:422), PTRTDISSFKNIYRYAFDFARDKDQRSL (SEQ ID NO:423), SMLALLLGRTWPLFSVIFYQYLE QSKYRVM (SEQ ID NO:424), FSRTVHADLSN YDEDGAWPVLLDEFVE (SEQ ID NO:425), IYRYAFDFAR (SEQ ID NO:426), KD QRSLDI (SEQ ID NO:427), NVLEFSRT (SEQ ID NO:428), and/or DLSNYDEDGA
5 WPVLLDEFVEW (SEQ ID NO:429). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 11. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 11.

This gene is expressed primarily in aortic endothelium, and to a lesser extent, in
10 cancers.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, endothelial disorders, particularly abnormalities of the vascular system
15 and cancers. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the vascular system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., endothelial, vascular, and
20 cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
25 NO:157 as residues: Arg-22 to Lys-31.

The tissue distribution in aortic endothelium indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment, detection, and/or prevention of abnormalities of the vascular system (i.e. embolism, atherosclerosis,
30 aneurysm, stroke, microvascular disease, etc.) and cancers. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ
35 ID NO:43 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 644 of SEQ ID NO:43, b is an integer of 15 to 658, where both a and b correspond to the positions of nucleotide residues shown in
5 SEQ ID NO:43, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 34

10 Polypeptides of the invention do not comprise the polypeptide sequence shown as Genbank Accession W59652, which is hereby incorporated herein by reference. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: LFRCPIGKAGTPAGXGPEFPGRPTRPVREKELTETFE (SEQ ID NO:430), FFVFPYPYPFRPLPPIPFPRFPWFRRNFPIPIPESAPTTPLPSEK (SEQ ID
15 NO:432), PWFRRNFPIPIPESAPTTPLP (SEQ ID NO:433), and/or GKAGTPAGXGPEFPGRPTRPV (SEQ ID NO:431). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in Hodgkin's lymphoma.

Therefore, polynucleotides and polypeptides of the invention are useful as
20 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly Hodgkin's lymphoma. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell
25 type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual
30 having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:158 as residues: Ser-21 to Asp-35, Pro-47 to Pro-52, Pro-62 to Asn-67.

35 The tissue distribution in Hodgkin's lymphoma tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of Hodgkin's lymphoma. Moreover, polynucleotides and

polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic-related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex- vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:44 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 552 of SEQ ID NO:44, b is an integer of 15 to 566, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:44, and where b is greater than or equal to a + 14.

25 FEATURES OF PROTEIN ENCODED BY GENE NO: 35

When tested against U937 and K562 cell lines, supernatants removed from cells containing this gene activated both the GAS (gamma activating sequence), and the ISRE (interferon-sensitive responsive element) promoter elements. Thus, it is likely that this gene activates pro-myeloid, leukemic, or more generally, other cells or cell-types, through the JAK-STAT signal transduction pathway. GAS is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells. ISRE is a promoter element found upstream in many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a

large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. The translation product of this gene was shown to have

5 homology to a conserved trypsin inhibitor which is thought to play an essential role in protein metabolism and regulation (See Genbank Accession No. pirlS35098|S35098). In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

FYPPMTQGKESLPLLALQIFNTTFRPSFAFFSGHRTLFFGVRSNP NPPKPRIFLIW
10 LIAVAL (SEQ ID NO:434), LLALQIFNTTFRPSFAFFSGHRTLFFGVRSNP (SEQ ID NO:435), HLAQTVMMHPQKSFYQVKNTNHS DRGAIEETQILEDRLGQIPLCLES
QIWEA (SEQ ID NO:436), KNTNHS DRGAIEET QILEDRLGQIPLCL (SEQ ID NO:437), QGCYRRDS NIGRQVRPDSIMLRKPD LGSITHYGSVLGNLNYCDLP
QLYRNPSLGNSGMREMFSPFYNPVECHP (SEQ ID NO:438), PDSIMLRKPD
15 LGSITHYGSVLGN (SEQ ID NO:439), and/or YRNPSLGNSGMREMFSPFYNPV (SEQ ID NO:440). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in brain frontal cortex.

Therefore, polynucleotides and polypeptides of the invention are useful as

20 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural disorders, particularly disorders of the central nervous system or endocrine system. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the

25 tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system or endocrine system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample

30 taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in brain frontal cortex, combined with the detected GAS and ISRE biological activities indicates polynucleotides and polypeptides corresponding

35 to this gene are useful for diagnosis or treatment of disorders of the central nervous system, caused by trauma, inflammation, demyelination, neoplasia, and degenerative diseases. Additionally, the molecule may function as a neuropeptide or hormone.

Moreover, considering the homology to a trypsin inhibitor and its localization in the brain, indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:45 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1263 of SEQ ID NO:45, b is an integer of 15 to 1277, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:45, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 36

The translation product of this gene was found to have homology to a zinc finger protein from *Mus musculus* (See Genbank Accession No. gn1PIDle225687) which is thought to be involved in the modulation of gene regulation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: NSARGLSGGHPFPWLSEGHFPF (SEQ ID NO:441), TDSDLTLGILLGLI YTNHIWEMFLAASRINSPKLEPEKSVKRQINFSSKDVGCSEVPKDGPP LSHGKEWIPLSHRKGWIPLSHMKGWPSLSHGKGWPP LSPRAEF (SEQ ID

NO:442), LGILLLLGIYTNHIWEMFLAA (SEQ ID NO:443), KSVKRQINFPSSKDV
GCSLEVPKDGPP (SEQ ID NO:444), GKEWIPLSHRKGWIPLSHMKGWPSLSH
(SEQ ID NO:445), GWASTQPRERMDPAQPQERMDPSQPHERMALTQPWKMAP
TQPSCRI (SEQ ID NO:446), and/or PAQPQERMDPSQPHERMALTQPWK (SEQ ID
5 NO:447). Polynucleotides encoding these polypeptides are also encompassed by the
invention.

This gene is expressed primarily in neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
10 biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, immune or hematopoietic disorders. Similarly, polypeptides and
antibodies directed to these polypeptides are useful in providing immunological probes
for differential identification of the tissue(s) or cell type(s). For a number of disorders
of the above tissues or cells, particularly of the immune system, expression of this gene
15 at significantly higher or lower levels may be routinely detected in certain tissues or cell
types (e.g., immune, hematopoietic cancerous and wounded tissues) or bodily fluids
(e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or
cell sample taken from an individual having such a disorder, relative to the standard
gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an
20 individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
NO:160 as residues: Ser-30 to Asp-39.

The tissue distribution in neutrophils indicates polynucleotides and polypeptides
corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
25 immune disorders involving neutrophils, including neutropenia. The expression of this
gene product indicates a role in regulating the proliferation; survival; differentiation;
and/or activation of hematopoietic cell lineages, including blood stem cells. This gene
product may be involved in the regulation of cytokine production, antigen presentation,
or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by
30 boosting immune responses). Since the gene is expressed in cells of lymphoid origin,
the natural gene product may be involved in immune functions. Therefore it may be also
used as an agent for immunological disorders including arthritis, asthma,
immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis,
granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia,
35 neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune
reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-
host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue

injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. The protein product of this gene can be used in the preparation of therapeutic compositions, for treating, preventing or delaying the recurrence of a tumour or neuronal disorders, e.g. genetic diseases or acquired degenerative encephalopathies such as Alzheimer's disease. Moreover, the protein is also useful in the induction or inhibition of cellular apoptosis resulting in inhibition of tumour cell growth, to suppress tumour formation, to induce G1 arrest of the cell cycle and to act as nuclear transcription factor. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:46 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 428 of SEQ ID NO:46, b is an integer of 15 to 442, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:46, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 37

When tested against U937 and K562 cell lines, supernatants removed from cells containing this gene activated both the GAS (gamma activating sequence), and the ISRE (interferon-sensitive responsive element) promoter elements. Thus, it is likely that this gene activates pro-myeloid, leukemic, or more generally, other cells or cell-types, through the JAK-STAT signal transduction pathway. GAS is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells. ISRE is a promoter element found upstream in

many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and

5 differentiation of cells. The protein product of this gene was found to have homology to the G-protein coupled receptor TM1 long consensus polypeptide (See Genbank Accession No. R50790) which indicates the protein is useful in the modulation of signalling events, cell-cycle regulation and/or transcriptional regulation. In specific embodiments, polypeptides of the invention comprise the following amino acid
10 sequence: IANGGGRPIKLNALYK IQNECKIVFTCIDF (SEQ ID NO:448), and/or MPCIK SKMNAKLFSVLTLCCMIPISVLFGTCI (SEQ ID NO:449).

Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 1. Accordingly, polynucleotides related to this invention are useful as a marker in linkage
15 analysis for chromosome 1.

This gene is expressed primarily in duodenum.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
20 not limited to, gastrointestinal disorders, particularly abnormalities of the duodenum. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the digestive system, expression of this gene at significantly higher or lower levels may be
25 routinely detected in certain tissues or cell types (e.g., gastrointestinal, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

30 The tissue distribution in duodenum, the homology to the TM1 g-protein coupled receptor consensus sequence, in addition to the detected GAS and ISRE biological activities, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of the abnormalities of the duodenum, particularly proliferative conditions such as cancers. Moreover, the
35 protein can be used in G-protein coupled receptor ligand binding assays. The assay can be used to identify fragments from GPR proteins (see Genseq Accession Nos. R48686-R48758 for examples) which retain biological activity such as binding a GPR ligand or

modulating GPR ligand binding to a GPR (see Genseq Accession Nos. R48759-R48758, R50569-R50807 and R89189-R89195 for examples of polypeptide fragments). The polypeptide fragments can be used in compositions for treating subjects suffering from a pathology related to a GPR abnormality e.g. a psychotic disorder such as schizophrenia. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:47 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 876 of SEQ ID NO:47, b is an integer of 15 to 890, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:47, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 38

The translation product of this gene shares sequence homology with a growth and transformation dependent protein (>gil207250), which is thought to be important in the regulation of cellular growth and proliferation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:
 QVAMGSLSGRLAAGSCFRLCERDVSSSLRLTRSSDLKRINGFCTKPQESPG
 APSRTYNRVPLHKPTDWQKKILIWSGRFKKEDEIPETVSLEMLDAAKNK (SEQ ID NO:450), GLRLAAGSCFRLCERDVSSSLRLTR (SEQ ID NO:451), APSRTYNRVPLHKPTDWQKK (SEQ ID NO:452), IWSGRFKKEDEIPETVSLEMLDA (SEQ ID NO:453), MDFAQNHVRKVPPELHPALTTECLYTNLRIGRKRSSYGQVASKRKM
 KSQRLSRWRCLMLQRTRCE (SEQ ID NO:454), KVPPELHPALTTECLYTNLR (SEQ ID NO:455), KRSSYGQVASKRKMKSQRLSRWRCLM (SEQ ID NO:456), INGFCTKPQESP (SEQ ID NO:457), RVPLHKPTD (SEQ ID NO:458), WSGRFKKE (SEQ ID NO:459), EMLDAAKNK (SEQ ID NO:460), SYLMIALTV (SEQ ID NO:461), and/or MVIEGKKAA (SEQ ID NO:462). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in ovary.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, or endocrine disorders, particularly abnormalities of the ovary. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, endocrine, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:162 as residues: Lys-25 to Thr-33, Leu-39 to Glu-47.

The tissue distribution in ovary, combined with the homology to the growth and transformation dependent protein, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of the abnormalities of the ovary such as ovarian cancer. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:48 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 723 of SEQ ID NO:48, b is an integer of 15 to 737, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:48, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 39

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: RPGMRALGSCLSLLALCSPQARPGPRTLDASTATLTLPHF
 5 SPCARFSPVGPSAVPFAATPLPLAGPHQP (SEQ ID NO:463), GSCLSLLALCS
 PQARPGPRT (SEQ ID NO:464), HFSPCARFSPVGPSAVPFAATPL (SEQ ID
 NO:465), AIEERNKSRLTQQASEPTGSPRYLHEQHPGSRSQMDCGSLTMXCPPP
 RVRDDRTSARGVPRQAAPDIVGGRPSSRACVSXPACAPSAAVFPY (SEQ ID
 NO:466), LTQQASEPTGSPRYLHEQHPGSR (SEQ ID NO:467), and/or SARG
 10 VPRQAAPDIVGGRPSSRACVS (SEQ ID NO:468). Polynucleotides encoding these
 polypeptides are also encompassed by the invention.

This gene is expressed primarily in ovarian tumor.

Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 15 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, reproductive or endocrine disorders, particularly ovarian tumors.
 Similarly, polypeptides and antibodies directed to these polypeptides are useful in
 providing immunological probes for differential identification of the tissue(s) or cell
 type(s). For a number of disorders of the above tissues or cells, particularly of the
 20 female reproductive system, expression of this gene at significantly higher or lower
 levels may be routinely detected in certain tissues or cell types (e.g., reproductive,
 endocrine cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum,
 plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken
 from an individual having such a disorder, relative to the standard gene expression
 25 level, i.e., the expression level in healthy tissue or bodily fluid from an individual not
 having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
 NO:163 as residues: Met-1 to Gly-6, Trp-23 to Arg-29, Ala-38 to Ser-45.

The tissue distribution in ovarian tumor tissue indicates polynucleotides and
 30 polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or
 prevention of reproductive disorders, particularly ovarian conditions, such as tumors.
 Protein, as well as, antibodies directed against the protein may show utility as a tumor
 marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available
 35 and accessible through sequence databases. Some of these sequences are related to SEQ
 ID NO:49 and may have been publicly available prior to conception of the present
 invention. Preferably, such related polynucleotides are specifically excluded from the

scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 557 of SEQ ID NO:49, b is an integer of 15 to 571, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:49, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 40

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: PRVRKTPHLSASGK (SEQ ID NO:469), YYYSMLKICHITI LETLSDRTPRKFAK KCYILYIKLSDSSVEKVAYTLLLLIPAAIEKK (SEQ ID NO:470), and/or TLETLSDRTPRKFAK KCYILYIKLSDSSVEK (SEQ ID NO:471).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in endometrial stromal cells treated with estradiol.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive disorders, particularly cancer of the endometrium. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, endometrial, and cancerous and wounded tissues) or bodily fluids (e.g., lymph, serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:164 as residues: Met-1 to Ser-7.

The tissue distribution in endometrial stromal cells indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of diseases of the endometrium, particularly cancer or diseases caused by hormonal imbalances. Protein, as well as, antibodies directed against the protein may

show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:50 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 342 of SEQ ID NO:50, b is an integer of 15 to 356, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:50, and where b is greater than or equal to a + 14.

15 FEATURES OF PROTEIN ENCODED BY GENE NO: 41

The translation product of this gene shares sequence homology with the smaller hepatocellular oncoprotein which is thought to be important in protein synthesis leading to cellular transformation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: VHTKEIFRERSAGFPVK (SEQ ID NO:472), LEMGFQPTKEINARGSEPCQAQSTSLPKLPRWGSRPEAPQTPQGG LESRCCTPVSKQSLNLKADRFKALTLGRAQWLT PVIQALSELRWVDHLRSGV (SEQ ID NO:473), FQPT KEINARGSEPCQAQSTSLPK (SEQ ID NO:474), PKLPR WGSRPEAPQTPQGGLESRCCTP (SEQ ID NO:475), and/or RFKALTLGRAQWLT PVIQALSELRWVD (SEQ ID NO:476). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in human bladder.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, urogenital disorders, particularly proliferative conditions, such as bladder tumors. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the bladder, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., urogenital, bladder, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal

fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID

5 NO:165 as residues: Pro-30 to Lys-38, Pro-45 to Ile-60, Leu-79 to Ser-96, His-98 to Gly-118.

The tissue distribution in bladder tumors indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis of carcinomas and preneoplastic or pathological conditions of bladder, or of the urogenital/renal system.

10 Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:51 and may have been publicly available prior to conception of the present

15 invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 899 of SEQ ID NO:51, b is an integer of 15 to

20 913, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:51, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 42

25

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: RIPLQSDGSFLHEKSSQQRSNRNFPCPTLQCNPEVSFWFV VTDP SKNHTLPAVEVQSAIRMNKNRINNAFFLNDQTLEFLKIPSTLAPPMDPS VPIWIIIFGVIFCIIIVAIALLLSGIWQRRRKNKEPSEVDDAEDKCENMITIENGIP

30 SDPLDMKG GHINDAFMTEDERLTPL (SEQ ID NO:477), PCPTLQCNPEVSF WFVVTDP SKNHT (SEQ ID NO:478), AIRMNKNRINNAFFLNDQTLEFL (SEQ ID NO:479), IWQRRRKNKEPSEVDDAEDKCENM (SEQ ID NO:480), PLDMKG GHINDAFMTEDER (SEQ ID NO:481), GSRTTALQRGVSLSSSVMKASLICPP FMSRGSEGMPFSIVIMFSLSSASSTSDGSLFLLRCQIPDKISSAIATMM

35 MQNITPNIIQMGTDGSMGGASVEGIFKNSRVWSFRKKALLIRFLFILMADCTST A GRV (SEQ ID NO:482), VSLSSSVMKASLICPPFMSRGSEGMPFS (SEQ ID

NO:483), and/or SMGGASVEGIFKNSRVWSFRKKAL (SEQ ID NO:484).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in kidney, and to a lesser extent, in gall bladder and testes.

5 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, diseases of the renal, urogenital, or reproductive system. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing
10 immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the renal system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., renal, urogenital, reproductive, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, seminal fluid, synovial
15 fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:166 as residues: Lys-60 to Ala-66, Thr-78 to Ser-83.

20 The tissue distribution in kidney indicates the protein product of this gene could be used in the treatment and/or detection of kidney diseases including renal failure, nephritis, renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and kidney stones, in addition to Wilm's Tumor Disease, and congenital
25 kidney abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome. Moreover, the tissue distribution in gall bladder indicates that the protein is useful for the treatment, detection, and/or prevention of various metabolic disorders. Alternatively, the expression within testes indicates that the protein is useful in normal testicular function. Therefore, this gene product may be useful in the treatment of male
30 infertility, and/or could be used as a male contraceptive. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ
35 ID NO:52 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1342 of SEQ ID NO:52, b is an integer of 15 to 1356, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:52, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 43

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: GARGSQQDAPALQEA EVRGP ERAQPARGR (SEQ ID NO:485), SERPGEGPARPGQDDQGPAVPAVAGAGVGVHDPADHRVLGQRSAA HFY LHTSFSRPHTGPPLTPGPDRTGSSRPTPMSTSFWTISHAGVKQSDLPRKE TEQPPAPGEHGGERERLRLVPARRPAQPRPGPAAGGAEERAAGLLRQLQP GLPHQGARIRRH PQLGAEPDRGRPARGHLLRAQGGLHQLEARD DRAER KPAAPRCALPRPAAH PARARAQRQ RAPDLQQVLAPLREALPPHEGQAQEVHQ VPLRARPLRAPDLRLPQQVRAGERGVLPQVRR AHAAGVRQPHQPARLGAR GLPRWPQGVLRLHPVPAGPAHGEAGALQRALAAGVPPLPPVPDRLRFLG KLETLD EDA AQLLQLLQVDRQSASPRATGTGPPAAGRRTGSPRSPWPGG SSCINSTRPTLFSSATPSPKTSSETESFRVAFSRVPGT (SEQ ID NO:486), RPGQ DDQGP AVPAVAGAGVGVHDP A (SEQ ID NO:487), SRPHTGPPLTPGPDRT GSSR (SEQ ID NO:488), SHAGVKQSDLPRKETEQPPAPGE (SEQ ID NO:489), RRPAQPRPGPAAGGAEERAAGLL (SEQ ID NO:490), RRHPQLGAEPDRGR PARGHLL (SEQ ID NO:491), RDDRAERKPAAPRCALPRPAAH PAR (SEQ ID NO:492), RAPDLQQVLAPLREALPPHEGQAQEV (SEQ ID NO:493), DLRLPQQ VRAGERGVLPQVRR AHAAG (SEQ ID NO:494), QPARLGARGLPRWPQGVLRLHPVPAG (SEQ ID NO:495), AGVPPLPPVPDRLRFLGKLETLD E (SEQ ID NO:496), QLLQLLQVDRQSASPRATGTGPPAA (SEQ ID NO:497), NSTRPTLFSS ATPSPKTSSETESFR (SEQ ID NO:498), LGGKRTAGPPGVAAAAARRPRPE SPASPGIVVDLARVAEAVHLPVLVEGRQLLRVRVQQVLDEVGEGHLEASA EGLARRGGQAGVVG VHPQHGHGELAVELLVLQLELAAEGGDQAHEGVAHEE ELGVLL ELDLHEVAGELPVAAPELVEGQVRAGVVHVLARDAQRVAVGRTA VQQASAQH DHHALPVGAGHLGHVAVDGPVPVVDQVAQLRVGDVVECALLG GEGQAGVGAEAPQHVPPLRLLPALVWAAPGVARGPVVASHALLHAPPA QAAAPSPFWEGHSASRQHEKLSRNSSTSES AVSS LSCPARAWAAAAPCAA (SEQ ID NO:499), EAVHLPVLVEGRQLLRVRVQQV (SEQ ID NO:500), GHLEA SAEGLARRGGQAGVVG VHP (SEQ ID NO:501), QLELAAEGGDQAHEGVAHE

EELGVLLEL (SEQ ID NO:502), GELPVAAPELVEGQVRAGVVHVLARDA (SEQ ID NO:503), AVQQASAQHDHHALPVGAGHLGHVA (SEQ ID NO:504), ALVW AAPGVARGPVVASHALLHA (SEQ ID NO:506), HDQVAQLRVGDVVECALLG GEGQAG (SEQ ID NO:505), PPAQAAAPSPFWEGHSASRQHEKLSRNS (SEQ ID NO:507), SRVTFPERRRSSRLRRGSMEESVRGYDWSPRDARRSPDQGRQQAER
 5 RRNVLRGFCANSSLAFTKERAFDDIPNSEL SHLIVDDR HGAIYCYVPKV ACTNWKRVMIVLSGSL LHRGAPYRDPLRIPREHVHNASAH LTFNKFWRRY GK LSRHLMKVKLKKYTKFLFVRDPFVRLISAFRSKFELENEEFYRKFAVPM LRVY ANHTSLPASAREAFRAGLKVSFANFIQYLLDPHTEKLAPFNEHWRQVYRLC
 10 HPCQIDYDSWGSWRLWTRTPRSCCSYSRWTGSPLPPELPEQDRQQLGGGLVR QDPPGLEAAAV (SEQ ID NO:508), RSPDQGRQQAERRNVLRGFCANSSLA (SEQ ID NO:509), TKERAFDDIPNSEL SHLIVDDR HGAIYC (SEQ ID NO:510), FNKFWRRY GKLSRHLMKVKLKKY (SEQ ID NO:511), FVRLISAFRSKFELENEEFYRKFA (SEQ ID NO:512), TSLPASAREAFRAGLKVSFANFIQYL (SEQ ID NO:513), and/or SYSRWTGSPLPPELPEQDRQQLGGG (SEQ ID NO:514).

Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 7. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 7.

20 It has been discovered that this gene is expressed primarily in PMA activated monocytic HL60 cells.

Therefore, nucleic acids of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of the following diseases and conditions: blood related disease such as
 25 leukemia. Similarly, polypeptides and antibodies directed to those polypeptides are useful to provide immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be detected in certain tissues (e.g., immune, hematopoietic, and cancerous and wounded
 30 tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid or spinal fluid) taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
 35 NO:167 as residues: Ala-29 to Thr-37, Pro-39 to Leu-63.

The tissue distribution in HL60 cells suggests the protein product of this clone is useful for the diagnosis, treatment, and/or prevention of blood related diseases such

as leukemia. Moreover, the protein product of this clone is useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:53 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence would be cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1533 of SEQ ID NO:53, b is an integer of 15 to 1547, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:53, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 44

When tested against fibroblast cell lines, supernatants removed from cells containing this gene activated the EGR1 (early growth response gene 1) promoter element. Thus, it is likely that this gene activates fibroblasts, or more generally, other cells or cell types, through the EGR1 signal transduction pathway. EGR1 is a separate signal transduction pathway from Jak-STAT, genes containing the EGR1 promoter are induced in various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. The gene encoding the disclosed cDNA is believed to reside on chromosome 12. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 12. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: STGCSE (SEQ ID NO:515),

CLCLGCGLPELHSYLDPGPYLLVYPTLFWLCPSAVSPWAYTCYQLGLGPQWGA
 AALSFTVDAAIRVWDVSTETCVPLPWFRGGGVTNCSGPQTAAKSWLPLLQLSF
 ESGRPRCGLVRGGLLYQGAVRLAA GAQMAADCCSLYWESH (SEQ ID
 NO:516), YPTLFWLCPSAVSPWAYTCYQLGLGP (SEQ ID NO:517), DVSTETCV
 5 LPWFRGGGVTNCSGPQ (SEQ ID NO:518), LLYQGAVRLAA GAQMAADCCSL
 (SEQ ID NO:519), NKRKTYLFLEVGMWGVGQNRWWPWERVPRGRGWGCL
 SKEGQVMNRASTPSRGLGPPKHWAKTWKLIDKVQRDVGNSACGPAH
 TEQGPFVEGRWKVMSWGWAPGSPWIMPQGRSSNTGLFRVRKRRMTGLPS
 CTLGFPFISTARRSPLGSQTME (SEQ ID NO:520), GVGQNRWWPWERVPRG
 10 RGWGCLSKEG (SEQ ID NO:521), AKTWKLIDKVQRDVGNSACGPAHTE
 (SEQ ID NO:522), and/or WAPGSPWIMPQGRSSNTGLFRVRKRRMTGLPSC
 TLGFPFIST (SEQ ID NO:523). Polynucleotides encoding these polypeptides are also
 encompassed by the invention.

This gene is expressed primarily in fetal tissues such as fetal brain, fetal liver,
 15 fetal kidney, and to a lesser extent, in T cells and macrophages.

Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, blood-related, immuno-related, neural-related, or developmental
 20 disorders. Similarly, polypeptides and antibodies directed to these polypeptides are
 useful in providing immunological probes for differential identification of the tissue(s)
 or cell type(s). For a number of disorders of the above tissues or cells, particularly of
 the hematopoiesis and immune system, expression of this gene at significantly higher or
 lower levels may be routinely detected in certain tissues or cell types (e.g., neural,
 25 immune, hematopoietic, urogenital, renal, hepatic, metabolic, developmental, and
 cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, amniotic fluid,
 bile, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from
 an individual having such a disorder, relative to the standard gene expression level, i.e.,
 the expression level in healthy tissue or bodily fluid from an individual not having the
 30 disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
 NO:168 as residues: Cys-126 to Thr-138, Glu-165 to Gly-172, Thr-189 to Leu-200,
 Gly-222 to Gly-229, Pro-346 to Lys-354.

The tissue distribution in fetal liver indicates polynucleotides and polypeptides
 35 corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
 blood related diseases, particularly immune or hematopoietic disorders. Alternatively,
 the expression within fetal brain indicates polynucleotides and polypeptides

corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Alternatively, the expression within fetal kidney indicates the protein product of this gene could be used in the treatment and/or detection of kidney diseases including renal failure, nephritis, renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and kidney stones, in addition to Wilm's Tumor Disease, and congenital kidney abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome. Moreover, the expression within various fetal tissues, combined with the detected EGR1 biological activity, indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:54 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1324 of SEQ ID NO:54, b is an integer of 15 to 1338, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:54, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 45

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: SSYQCPKVTFFKSSVDT (SEQ ID NO:524). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 15. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 15.

This gene is expressed primarily in glioblastoma, liver, fetal lung, and amygdala.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural, metabolic, or developmental disorders, particularly mental or neurodegenerative conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, metabolic, developmental, pulmonary, hepatic, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, amniotic fluid, pulmonart surfactant or sputum, bile, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:169 as residues: Pro-31 to Ala-37, Lys-62 to Asn-72.

The tissue distribution in glioblastoma and amygdala indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of central nervous system disorders. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder,

learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The protein may also be useful in the treatment, detection, and/or prevention of liver disorders, which include, but are not limited to hepatoblastoma, jaundice, hepatitis, liver metabolic diseases and conditions that are attributable to the differentiation of hepatocyte progenitor cells. In addition the expression in fetus would suggest a useful role for the protein product in developmental abnormalities, fetal deficiencies, pre-natal disorders and various wound-healing models and/or tissue trauma. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:55 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 2057 of SEQ ID NO:55, b is an integer of 15 to 2071, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:55, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 46

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: YIYSYLGFFNQINK (SEQ ID NO:525). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed in only T-cell helper II cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly infectious diseases, inflammatory, or immunodeficiency conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for

differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:170 as residues: Pro-44 to Tyr-49.

The tissue distribution in T-helper cells indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment of infectious diseases. Moreover, the expression of this gene product indicates a role in regulating the proliferation; survival; differentiation; and/or activation of hematopoietic cell lineages, including blood stem cells. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:56 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1885 of SEQ ID NO:56, b is an integer of 15 to 1899, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:56, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 47

The translation product of this gene has been shown to have homology to the human nuclear factor IV (See Genbank Accession No. gi135038), which is thought to play a role as a type 2 DNA helicase in DNA metabolism either during transcription, DNA repair, and/or during the cell-cycle. Moreover, the protein may play a role in chromosomal translocations. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ARDLIL (SEQ ID NO:526), LTFYL QFLAPKDKPSGDTAAVFEEGGDVDDL VSTFNMHLVFCD (SEQ ID NO:527), and/or FLAPKDKPSGDTAAVFEEGGDVDDL (SEQ ID NO:528). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 2. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 2.

This gene is expressed primarily in activate T-cells, and to a lesser extent, in B-cells and monocytes.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune or hematopoietic disorders, particularly leukemia, Grave's disease, rheumatoid arthritis and other autoimmune diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:171 as residues: Gly-27 to Cys-35.

The tissue distribution in T-cells, B-cells, and monocytes indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment or diagnosis of immune system diseases. Moreover, the expression of this gene product indicates a role in regulating the proliferation; survival; differentiation; and/or activation of hematopoietic cell lineages, including blood stem cells. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the natural gene product may be involved in immune functions. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immunodeficiency diseases such as AIDS, leukemia, rheumatoid arthritis, granulomatous disease, inflammatory bowel disease, sepsis, acne, neutropenia, neutrophilia, psoriasis, hypersensitivities, such as T-cell mediated cytotoxicity; immune reactions to transplanted organs and tissues, such as host-versus-graft and graft-versus-host diseases, or autoimmunity disorders, such as autoimmune infertility, lense tissue injury, demyelination, systemic lupus erythematosus, drug induced hemolytic anemia, rheumatoid arthritis, Sjogren's disease, scleroderma and tissues. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:57 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1529 of SEQ ID NO:57, b is an integer of 15 to 1543, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:57, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 48

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ARAGAKILFEGEF (SEQ ID NO:529), NFEIHSAPFMLFVA
 5 CLLHSSCPRTARFLASPLSESNVIFYQNQYQFPCILCFIEFARLTSFKHLIHSQSH
 LVRLQYEDFSVSSE AWDTELT (SEQ ID NO:530), FPFMLFVACLLHSSCPRTA
 RFLASPL (SEQ ID NO:531), NVIFYQNQYQFPCILCFIEFARLTSF (SEQ ID
 NO:532), and/or SQSHLVRLQYEDFSVSSE AWDTE (SEQ ID NO:533).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

- 10 The gene encoding the disclosed cDNA is believed to reside on chromosome 14.
 Accordingly, polynucleotides related to this invention are useful as a marker in linkage
 analysis for chromosome 14.

This gene is expressed primarily in fetal tissues such as fetal liver, fetal brain,
 fetal lung and fetal spleen.

- 15 Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, developmental disorders and cancers. Similarly, polypeptides and
 antibodies directed to these polypeptides are useful in providing immunological probes
 20 for differential identification of the tissue(s) or cell type(s). For a number of disorders
 of the above tissues or cells, particularly of the immune system and nervous system,
 expression of this gene at significantly higher or lower levels may be routinely detected
 in certain tissues or cell types (e.g., developmental, hepatic, immune, hemaopoietic,
 neural, pulmonary, and cancerous and wounded tissues) or bodily fluids (e.g., serum,
 25 plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell
 sample taken from an individual having such a disorder, relative to the standard gene
 expression level, i.e., the expression level in healthy tissue or bodily fluid from an
 individual not having the disorder.

- Preferred epitopes include those comprising a sequence shown in SEQ ID
 30 NO:172 as residues: Gly-37 to Asp-46, Ser-48 to Val-54.

- The tissue distribution in fetal tissues indicates polynucleotides and polypeptides
 corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
 developmental disorders and cancers. Moreover, the expression within embryonic
 tissue and other cellular sources marked by proliferating cells indicates that this protein
 35 may play a role in the regulation of cellular division, and may show utility in the
 diagnosis and treatment of cancer and other proliferative disorders. The protein is also
 useful in the treatment, detection, and/or prevention of immune, hematopoietic,

pulmonary, or metabolic diseases, disorders, and/or conditions. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:58 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1119 of SEQ ID NO:58, b is an integer of 15 to 1133, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:58, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 49

The translation product of this gene was found to have homology to a 35kd pulmonary surfactant protein, as well as, a GABA-like receptor (See Genbank Accession Nos. P70663, and gil540271, respectively), the latter of which is thought to be important in neuronal function. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: QKFLCASDGD (SEQ ID NO:534), AEVPLRVRRRHGRPHGPGGRQLALGIPALRSLPGCVPRHHGC SPGYGCLHRRILCLPLILLVYKQRQAASNRR AQELVRMDSNIQGIENPGF EASPPAQGIPEAKVRHPLSYVAQRQPSESGRHLLSEPSTPLSPPGPGDVFF PSLDPVPDSPNF EVIXPXWGT VGCCGWVWGRCI (SEQ ID NO:535), GP GG RQLALGIPALRSLPGCVPRHHGC (SEQ ID NO:536), FEASPPAQGIPEAK VRHPLSYVAQR (SEQ ID NO:537), DMSLGMWQH QWDKMDTGPPSQAPD TGHGGETSPPWHALGSPVLPEAALLSDFLFVPQWLWGQACLPTGHRHLPQLPP TSSF SEDLSTG (SEQ ID NO:538), PPSQAPDTGHGGETSPPWHALGS (SEQ ID NO:544), PVDRSSEKLLVGGSWGRWRWPVGRQAWPQSHCGTKRKSDRR AASGKTGEPSACHGGEVSPPCPVSGAWEG GPVSILSH (SEQ ID NO:539), PVDRSSEKLLVGGSWGRWRWPV (SEQ ID NO:540), TKRKSDRRAASG KTGEPSACHGGEV (SEQ ID NO:541). MTSKFGESGTGSRDGKKTSPGPG

GDRGVLGSESRCPDSEGCRWAT (SEQ ID NO:542), and/or SPGPGGDRGV LGSESRCPD (SEQ ID NO:543). Polynucleotides encoding these polypeptides are also encompassed by the invention.

5 This gene is expressed primarily in hematopoiesis cells such as neutrophils, eosinophils and T cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, blood diseases and/or immune diseases. Similarly, polypeptides and
10 antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the hematopoietic and immune systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hematopoietic, and cancerous and
15 wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
20 NO:173 as residues: Ser-44 to Ala-63, Pro-89 to Gly-98, Pro-129 to Trp-137.

The tissue distribution in neutrophils, eosinophils, and T cells indicates polynucleotides and polypeptides corresponding to this gene are useful for treating and diagnosis blood related diseases. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic
25 related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be
30 used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. The homology to a pulmonary surfactant protein indicates that the protein is useful in enhancing or inhibiting the efficacy of the
35 immune response across mucosal barriers, such as within the gastrointestinal tract, the sinuses, and the lungs. Protein, as well as, antibodies directed against the protein may

show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:59 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1476 of SEQ ID NO:59, b is an integer of 15 to 1490, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:59, and where b is greater than or equal to a + 14.

15 FEATURES OF PROTEIN ENCODED BY GENE NO: 50

When tested against U937 cell lines, supernatants removed from cells containing this gene activated the GAS (gamma activating sequence) promoter element. Thus, it is likely that this gene activates promyeloid cells, or more generally, other cells of the immune or central nervous system, through the JAK-STAT signal transduction pathway. GAS is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells. The gene encoding the disclosed cDNA is believed to reside on chromosome 1. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 1. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: HEVQPSYLPNSGLI (SEQ ID NO:545). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in the central nervous system, adult liver, adult heart, and infant brain.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural, cardiovascular, or metabolic conditions or disorders. Similarly,

polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely
5 detected in certain tissues or cell types (e.g., neural, cardiovascular, developmental, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, amniotic fluid, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an
10 individual not having the disorder.

The tissue distribution in tissues of the CNS and infant brain, combined with the detected GAS biological activity indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment, diagnosis, and/or prevention of CNS disorders. Moreover, polynucleotides and polypeptides corresponding to this
15 gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction,
20 aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene
25 product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or
30 apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available
35 and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:60 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the

scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1322 of SEQ ID NO:60, b is an integer of 15
5 to 1336, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:60, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 51

10 In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: LRISVLCRETACNWSHHPLDSN (SEQ ID NO:546).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

The gene encoding the disclosed cDNA is believed to reside on chromosome 18.

15 Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 18.

This gene is expressed in whole brain, embryos, fetal liver and fetal spleen, and melanocytes.

Therefore, polynucleotides and polypeptides of the invention are useful as
20 reagents for identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural, immune, hematopoietic, or developmental disorders, particularly mental disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s)
25 or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, immune, hematopoietic, developmental, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another
30 tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:175 as residues: Pro-27 to Lys-42.

35 The tissue distribution in brain indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of mental or neurodegenerative disorders. Alternatively, the expression within fetal

liver/spleen indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of hematopoietic related disorders such as anemia, pancytopenia, leukopenia, thrombocytopenia or leukemia since stromal cells are important in the production of cells of hematopoietic lineages. The uses include
5 bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. The gene product may also be involved in lymphopoiesis, therefore, it can be used in immune disorders such as infection, inflammation, allergy, immunodeficiency etc. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors
10 of various blood lineages, and in the differentiation and/or proliferation of various cell types. The protein may also be useful for the treatment and/or detection of metabolic disorders, which include Tay-Sachs disease, phenylketonuria, galactosemia, hyperlipidemias, porphyrias, and Hurler's syndrome. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy
15 targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:61 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the
20 scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1691 of SEQ ID NO:61, b is an integer of 15 to 1705, where both a and b correspond to the positions of nucleotide residues shown
25 in SEQ ID NO:61, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 52

30 When tested against U937 and fibroblast cell lines, supernatants removed from cells containing this gene activated both the GAS (gamma activating sequence) and EGR1 (early growth response gene 1) promoter elements. Thus, it is likely that this gene activates promyeloid cells, fibroblasts, or more generally, immune or integumentary cells or cell-types, through the JAK-STAT and/or EGR1 signal
35 transduction pathway. GAS is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells.

Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells. EGR1 is a separate signal transduction pathway from Jak-STAT, genes containing the EGR1 promoter are induced in various tissues and cell types upon
5 activation, leading the cells to undergo differentiation and proliferation. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: LTVTVRNPGSTHASGRPRRRSGVWARRGLVWQ (SEQ ID NO:547). Polynucleotides encoding these polypeptides are also encompassed by the invention.

10 This gene is expressed primarily in endometrial stromal cells and fetal brain tissue, and to a lesser extent, in microvascular endothelial cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, neural, developmental, or vascular disorders, particularly
15 vascular leak syndrome and inflammation. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the endothelium, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell
20 types (e.g., reproductive, neural, developmental, vascular, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

25 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:176 as residues: Pro-63 to Cys-72, Gly-88 to Cys-93.

The tissue distribution in endometrial stromal cells, infant brain, and microvascular endothelial cells, combined with the detected GAS and EGR1 biological activities, indicates polynucleotides and polypeptides corresponding to this gene are
30 useful for the treatment of various vascular disorders, which include, but are not limited to vascular leak syndrome, microvascular disease, atherosclerosis, aneurysm, stroke, embolism and inflammation. Moreover, the expression within embryonic tissue and other cellular sources marked by proliferating cells indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and
35 treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could

again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:62 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1017 of SEQ ID NO:62, b is an integer of 15 to 1031, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:62, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 53

Contact of cells with supernatant expressing the product of this gene has been shown to increase the permeability of the plasma membrane of HUVEC cells to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product binds a receptor on the surface of the plasma membrane of both vascular endothelial cells, in addition to other cell-lines or tissue cell types. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating endothelial cells, or more generally, neural or immune cells. Binding of a ligand to a receptor is known to alter intracellular levels of small molecules, such as calcium, potassium and sodium, as well as alter pH and membrane potential. Alterations in small molecule concentration can be measured to identify supernatants which bind to receptors of a particular cell. This protein is homologous to members of the butyrophilin gene family which are thought to play a role in myelin sheath development, in addition to serving as a membrane-specific receptor for cytoplasmic vesicles to the apical plasma membrane. In specific embodiments, polypeptides of the invention comprise the sequence

SAQFSVLGSPGPILAMVGEDADLPCHLFPTMSAETMELKW (SEQ ID NO:574).

Polynucleotides encoding these polypeptides are also encompassed by the invention. In

specific embodiments, polypeptides of the invention comprise the sequence

TPCSAQFSVLGSPGPILAMVGEDADLPCHLFPTMSAET (SEQ ID NO:548),

MELKWVSSSLRQVVNVYADGKEVEDRQSAPYRGRTSILRDGITAGKAALRIHN

VTASDSG (SEQ ID NO:549), LEVKG YEDGGIHL ECRSTGWYPQPQI (SEQ ID NO:550), MASSLAFLLLNFHVSLLL VQLLTPCSAQFSVLGPSGPILAMVGE DADLPCHLFPTMSAETMELK WVSSSLRQVVNVYADG (SEQ ID NO:551), RHEL SHNRKNGELLIDRLYSVGSDSPMGIPRDIIFTDGFYWNPKVKTLKDRHF

5 WQSIDENGKFPGFPSA QLSCLPPLGPAAHSLSSVFCAWTLWAHPGHGG (SEQ ID NO:552), LLIDRLYSVGSDSPMGIPRDIIFT (SEQ ID NO:553), NPKVKT LKDRHFWQSIDENGKFPGF (SEQ ID NO:554), LGPAAHSLSSVFCAWTLWA HPGH (SEQ ID NO:555), RLQHWVLIFTLEVKG YEDGGIHL ECRSTGWYPQP QIQWSNAKGENIPAVEAPVVADGVGLYEVAASVIMRGGSGEGVSCIHRNSLL

10 GLEKTASISIADPSSGAPSPGSQPWQGPCLSCCCFSPEPVTSCGDNRRK (SEQ ID NO:556), GGIHL ECRSTGWYPQPQIQWSNAKG (SEQ ID NO:557), PQIQWS NAKGENIPAVEAPVVADGVGL (SEQ ID NO:558), NIPAVEAPVVADGVGL YEVAASVIMRG (SEQ ID NO:559), SGAPSPGSQPWQGPCLSCCCFSPEPVT (SEQ ID NO:560), SSSICDHERRLRGGCILHHQKFPPRPGKDSQHFHRRP

15 FFRSAQPWIAALAGTLPILLLLLAGASYFLWRQQKEITALSSEIESEQEMKE MGYAATEREISLRESLQEELKRKKIQYLTRGEESSSDTNKSA (SEQ ID NO:561), KDSQHFHRRPFFRSAQPWIAALAGTLP (SEQ ID NO:562), EIESEQEMKE MGYAATEREISLRESLQE (SEQ ID NO:563), VNNMIAFY SARDSYVYPHFSG EEMLQ MRLHLVK (SEQ ID NO:564), TPCSAQFSVLGPSGPILAMVGEDADLP

20 CHLFPTMSAET (SEQ ID NO:565), KWVSSSLRQVVNVYADGKEVEDR (SEQ ID NO:566), RTSILRDGITAGKAALRIHNV TASD (SEQ ID NO:567), CYFQDGDYF EKALVELKVAALGS (SEQ ID NO:568), GYEDGGIHL ECRSTGWYPQPQIQ (SEQ ID NO:569), NIPAVEAPVVADGVGLYEVAASV (SEQ ID NO:570), QQKEITALSS EIESEQEMKEM (SEQ ID NO:571), LRESLQEELKRKKIQYLTRGEESS (SEQ ID

25 NO:572), and/or GEEMLQ MRLHLVK (SEQ ID NO:573). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 6. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 6.

This gene is expressed primarily in rhabdomyosarcoma, and to a lesser extent,

30 in T cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, muscle, immune, or neural disorders, particularly rhabdomyosarcoma,

35 infectious diseases, or neurodegenerative conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders

of the above tissues or cells, particularly of the immune system expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., muscle, immune, neural, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:177 as residues: Ala-78 to Arg-94.

The tissue distribution in rhabdomyosarcoma, the detected calcium flux biological activity, combined with the homology to the butyrophilin gene family indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis or treatment of muscle disorders, which include, but are not limited to, muscular dystrophy, cardiomyopathy, fibroids, myomas, and/or rhabdomyosarcomas. Moreover, the homology to the butyrophilin protein indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The protein may also show utility in the correction or amelioration of myelin sheath deficiencies in developing and mature neurons and neural-cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:63 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1575 of SEQ ID NO:63, b is an integer of 15 to 1589, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:63, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 54

10 In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: PQGGLTLPSVWG (SEQ ID NO:575), GGPCHLWLLGPRRT QLPGRRASLPFRSQGELTQAFLLGLWKHQMPALTQEQQVRAERRREAVRMEI PGLFFASLANWGLLYRTSQDFISPYLCAAPSTPHPPLGGP (SEQ ID NO:576), GPRRTQLPGRRASLPFRSQGELT (SEQ ID NO:577), QMPALTQEQQVRAER RREAVRMEI (SEQ ID NO:578), and/or ANWGLLYRTSQDFISPYLCAAPSTP (SEQ
15 ID NO:579). Polynucleotides encoding these polypeptides are also encompassed by the invention. The gene encoding the disclosed cDNA is believed to reside on chromosome 5. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 5.

20 This gene is expressed primarily in brain, and to a lesser extent, in testes tumor. Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural, endocrine, or reproductive disorders, particularly depression and infertility disorders. Similarly, polypeptides and antibodies directed to these
25 polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the endocrine and nervous systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, endocrine, reproductive, and cancerous and wounded tissues) or
30 bodily fluids (e.g., serum, plasma, urine, seminal fluid, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

35 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:178 as residues: Thr-26 to Glu-33.

The tissue distribution in brain indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of depression and

other endocrine-related disorders. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease,

5 Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in
10 feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. The protein product may also be useful in the treatment, detection, and/or
15 prevention of a variety of reproductive disorders which include, but are not limited to, the treatment of male infertility, and/or could be used as a male contraceptive. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available
20 and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:64 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more
25 polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1074 of SEQ ID NO:64, b is an integer of 15 to 1088, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:64, and where b is greater than or equal to a + 14.

30

FEATURES OF PROTEIN ENCODED BY GENE NO: 55

The translation product of this gene was found to have homology to the conserved R166.2 protein from *Caenorhabditis elegans* (See Genbank Accession
35 No.gil949849), which is thought to play an important role in the regulation of cellular function and processes. In specific embodiments, polypeptides of the invention comprise the sequence: LSFKDKSTYIESSTKVYDDMAFRYLSWILFPLL (SEQ ID

NO:580), CYAVYSLLYLEHKGWYSWVLSM (SEQ ID NO:590), LLTFGFITMTPQ
 LFINYKLKSV AHPWRMLT (SEQ ID NO:581), TYKALNTFIDDLFAFVIKMP
 VMYRJGCLRD (SEQ ID NO:582), DVVFFIYLYQRWIYRVDPTRVNEFGMSGED
 (SEQ ID NO:583), VAGIFPRLSFKDKSTYIESSTKVYDDMAFRYLSWILFPLL
 5 CYA (SEQ ID NO:584), PWVAGIFPRLSFKDKSTYIESSTKVYDD (SEQ ID
 NO:586), AGEDSCHPVLSVQPDVHDLGWQESSPAYPSRTSPRISSPRPKC
 MMIWHSCTCPGSSSR SWAAMPSTVFACTWSTRAGTPGCSACSTASC (SEQ ID
 NO:587), LSVQPDVHDLGWQESSPAYPSRTSPRISSP (SEQ ID NO:588), GSSSR
 SWAAMPSTVFACTWSTRAGTP (SEQ ID NO:589), and/or WAAMPSTVFACTWS
 10 TRAGTP (SEQ ID NO:585). Polynucleotides encoding these polypeptides are also
 encompassed by the invention. The gene encoding the disclosed cDNA is believed to
 reside on chromosome 19. Accordingly, polynucleotides related to this invention are
 useful as a marker in linkage analysis for chromosome 19.

This gene is expressed primarily in colon, smooth muscle and fetal bone.

15 Therefore, polynucleotides and polypeptides of the invention are useful as
 reagents for differential identification of the tissue(s) or cell type(s) present in a
 biological sample and for diagnosis of diseases and conditions which include, but are
 not limited to, gastrointestinal or vascular disorders, and abnormal muscular-skeletal
 development, including proliferative conditions such as cancer. Similarly, polypeptides
 20 and antibodies directed to these polypeptides are useful in providing immunological
 probes for differential identification of the tissue(s) or cell type(s). For a number of
 disorders of the above tissues or cells, particularly of the immune and muscular-skeletal
 system, expression of this gene at significantly higher or lower levels may be routinely
 detected in certain tissues or cell types (e.g., gastrointestinal, muscle, skeletal, vascular,
 25 developmental, and cancerous and wounded tissues) or bodily fluids (e.g., serum,
 plasma, amniotic fluid, urine, synovial fluid and spinal fluid) or another tissue or cell
 sample taken from an individual having such a disorder, relative to the standard gene
 expression level, i.e., the expression level in healthy tissue or bodily fluid from an
 individual not having the disorder.

30 Preferred epitopes include those comprising a sequence shown in SEQ ID
 NO:179 as residues: Ser-128 to Thr-133, Thr-158 to Thr-166, Leu-168 to Gly-175,
 Ala-179 to Asp-196.

The tissue distribution in colon and fetal bone indicates polynucleotides and
 polypeptides corresponding to this gene are useful for the treatment and diagnosis of
 35 abnormal bone formation, and/or various proliferative conditions (e.g. tumors),
 particularly of the gastrointestinal system. Moreover, the expression within smooth
 muscle tissue indicates polynucleotides and polypeptides corresponding to this gene are

useful for the detection, treatment, and/or prevention of a variety of vascular disorders, which include, but are not limited to the following: embolism, atherosclerosis, microvascular disease, aneurysm, stroke, and vascular leak syndrome. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:65 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1242 of SEQ ID NO:65, b is an integer of 15 to 1256, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:65, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 56

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: LGEFLSSQCFLP (SEQ ID NO:591). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in brain frontal cortex.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neural disorders, particularly neurological or neurodegenerative disorders and diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the brain, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:180 as residues: Ala-122 to Gly-128.

The tissue distribution in brain frontal cortex indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of some neurological diseases such as depression. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:66 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1588 of SEQ ID NO:66, b is an integer of 15 to 1602, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:66, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 57

When tested against U937 cell lines, supernatants removed from cells containing this gene activated the GAS (gamma activating sequence) promoter element. Thus, it is likely that this gene activates pro-myeloid cells, or more generally, immune or hematopoietic cells, through the JAK-STAT signal transduction pathway. GAS is a

promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins

involved in the proliferation and differentiation of cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

RSRRNRVAMGMWASLDALWE (SEQ ID NO:592), PRVRCQQRAEGGGMGAG
IGVGPSERTDIAVTPRGRSEGASVGVAPVHAEGAGGTGWPWGCGHRWTLCG
RCR PRSVSSGPCCSFPGQCIFGRPS (SEQ ID NO:593), GGMGAGIGVGPSER
TDIAVTPRGR (SEQ ID NO:594), GCGHRWTLCGRCR PRSVSSGPCCSF (SEQ
ID NO:595), and/or KKHGF NQQTGLGFFTWKYNKNKNLV (SEQ ID NO:596).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

The gene encoding the disclosed cDNA is believed to reside on chromosome 1.

Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 1.

This gene is expressed primarily in synovial cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, skeletal afflictions, particularly rheumatoid arthritis or autoimmune conditions. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., skeletal, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:181 as residues: Gln-27 to Val-39, Glu-50 to Arg-56.

The restricted tissue distribution in synovium, combined with the detected GAS biological activity, indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of rheumatoid arthritis since synovial fibroblasts are associated with the synovium and cartilage. Moreover, polynucleotides and polypeptides corresponding to this gene are useful in the detection and treatment of disorders and conditions afflicting the skeletal system, in particular osteoporosis, bone

cancer, as well as, disorders afflicting connective tissues (e.g. arthritis, trauma, tendonitis, chondromalacia and inflammation), such as in the diagnosis or treatment of various autoimmune disorders such as rheumatoid arthritis, lupus, scleroderma, and dermatomyositis as well as dwarfism, spinal deformation, and specific joint
5 abnormalities as well as chondrodysplasias (i.e. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). The protein may also be useful in the modulation of the immune response to regions of inflammation, or in inhibiting or ameliorating autoimmune responses. Protein, as well as, antibodies directed against the protein may
10 show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:67 and may have been publicly available prior to conception of the present
15 invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 924 of SEQ ID NO:67, b is an integer of 15 to
20 938, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:67, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 58

25

When tested against U937 cell lines, supernatants removed from cells containing this gene activated the GAS (gamma activating sequence) promoter element. Thus, it is likely that this gene activates pro-myeloid cells, or more generally immune or hematopoietic cells, in addition to other cells or cell-types, through the JAK-STAT
30 signal transduction pathway. GAS is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation
35 of cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: PKLLPCSPAEGHTSLGPLLPF (SEQ ID NO:597), ASLELXPS KSQLSTEWGFTWIVGLGMSPSTALWTECTCTPFLVLLSHASGHFFWLSPLAS

LVIPPVTDRK (SEQ ID NO:598), WGFTWIVGLGMSPSTALWTECTCTPFLVL
LSH (SEQ ID NO:599), VAVGVCREDDVMGITDRSKMSPDVGIWAIYWSAAGY
WPLIGFPGTPTQQEPALHRVGVYLDRTGNVSFYSAVDGVHLHTFSCS
SVSRLRPFFLVESISIFSHSTSD (SEQ ID NO:600), ITDRSKMSPDVGIWAIYW
5 SAAGYWPLI (SEQ ID NO:601), and/or RGTGNVSFYSAVDGVHLHTFSCSSV
SRLRP (SEQ ID NO:602). Polynucleotides encoding these polypeptides are also
encompassed by the invention. The gene encoding the disclosed cDNA is believed to
reside on chromosome 7. Accordingly, polynucleotides related to this invention are
useful as a marker in linkage analysis for chromosome 7.

10 This gene is expressed primarily in fetal tissues, and to a lesser extent, in liver
cells.

Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
biological sample and for diagnosis of diseases and conditions which include, but are
15 not limited to, developmental or liver diseases, such as hepatocellular carcinoma.
Similarly, polypeptides and antibodies directed to these polypeptides are useful in
providing immunological probes for differential identification of the tissue(s) or cell
type(s). For a number of disorders of the above tissues or cells, particularly of the
immune and hepatic systems, expression of this gene at significantly higher or lower
20 levels may be routinely detected in certain tissues or cell types (e.g., developmental,
hepatic, metabolic, and cancerous and wounded tissues) or bodily fluids (e.g., serum,
plasma, bile, breast milk, urine, synovial fluid and spinal fluid) or another tissue or cell
sample taken from an individual having such a disorder, relative to the standard gene
expression level, i.e., the expression level in healthy tissue or bodily fluid from an
25 individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
NO:182 as residues: Pro-30 to Gln-37, Arg-39 to Ser-45, Arg-74 to Arg-85.

The tissue distribution in liver, combined with the detected GAS biological
activity indicates polynucleotides and polypeptides corresponding to this gene are useful
30 for the treatment or diagnosis of hepatic conditions such as hepatocellular carcinoma.
Moreover, the expression within embryonic tissue and other cellular sources marked by
proliferating cells indicates that this protein may play a role in the regulation of cellular
division, and may show utility in the diagnosis and treatment of cancer and other
proliferative disorders. Similarly, developmental tissues rely on decisions involving cell
35 differentiation and/or apoptosis in pattern formation. Thus this protein may also be
involved in apoptosis or tissue differentiation and could again be useful in cancer

therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:68 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1571 of SEQ ID NO:68, b is an integer of 15 to 1585, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:68, and where b is greater than or equal to a + 14.

15 FEATURES OF PROTEIN ENCODED BY GENE NO: 59

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: GTRGLQNH RTE (SEQ ID NO:603). Polynucleotides encoding these polypeptides are also encompassed by the invention.

20 This gene is expressed primarily in prostate, and to a lesser extent, in tonsil and fetal lung.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive, immune, developmental, or pulmonary disorders and/or diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, immune, developmental, pulmonary, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, amniotic fluid, pulmonary surfactant or sputum, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:183 as residues: Lys-32 to Lys-38.

The tissue distribution in prostate indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of cancers, particularly of the prostate. The expression within tonsils indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of a variety of immune system disorders. The expression also indicates a role in regulating the proliferation; survival; differentiation; and/or activation of hematopoietic cell lineages, including blood stem cells. Moreover, the expression within fetal tissue indicates that this protein may play a role in the regulation of cellular division, and may show utility in the diagnosis and treatment of cancer and other proliferative disorders. Similarly, developmental tissues rely on decisions involving cell differentiation and/or apoptosis in pattern formation. Thus this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:69 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1662 of SEQ ID NO:69, b is an integer of 15 to 1676, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:69, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 60

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ELSGLG (SEQ ID NO:604). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in the brain.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, central nervous system disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for

differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:184 as residues: Tyr-15 to Lys-21, Pro-62 to Phe-68.

The tissue distribution in brain indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of CNS disorders (such as Parkinson's disease). Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:70 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1330 of SEQ ID NO:70, b is an integer of 15 to 1344, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:70, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 61

5 The gene encoding the disclosed cDNA is believed to reside on chromosome 3. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 3.

 This gene is expressed primarily in the brain.

 Therefore, polynucleotides and polypeptides of the invention are useful as
10 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, CNS diseases, such as Alzheimers and Parkinson's disease. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a
15 number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., neural, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to
20 the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:185 as residues: Asp-44 to Cys-53, Asp-56 to Lys-66, Ser-78 to Lys-84.

 The tissue distribution in brain tissue indicates polynucleotides and polypeptides
25 corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of CNS diseases such as Alzheimers and Parkinson's disease. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Huntington's Disease, Tourette Syndrome,
30 meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance,
35 and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition,

homeostasis, or neuronal differentiation or survival. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:71 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1460 of SEQ ID NO:71, b is an integer of 15 to 1474, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:71, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 62

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: MDDIKI (SEQ ID NO:605), NFCVSKNTFNRVKRPIKWVKIF ANDISCKRLISRIHKEILPFNNKKQPDFKVKKSRK (SEQ ID NO:606), FNRVKR PIKWVKIFANDISCKRLISRIHKE (SEQ ID NO:607), ETQMANKYMKRCSTL (SEQ ID NO:608), VIRELQVKATRCHYTPIKWSKSKTLISSNADEYVEPTRTLI HCWWKCKIVQPLCKTAW (SEQ ID NO:609), and/or ATRCHYTPIKWSKSKT LISSN (SEQ ID NO:610). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in duodenum, and to a lesser extent, in brain frontal cortex.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, gastrointestinal, neural, or endocrine disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the endocrine system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., gastrointestinal, neural, endocrine, and cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal

fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in colon indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of some gastrointestinal disorders, particularly cancers. Moreover, polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states, behavioral disorders, or inflammatory conditions which include, but are not limited to Alzheimer's Disease, Parkinson's Disease, Huntington's Disease, Tourette Syndrome, meningitis, encephalitis, demyelinating diseases, peripheral neuropathies, neoplasia, trauma, congenital malformations, spinal cord injuries, ischemia and infarction, aneurysms, hemorrhages, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, depression, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, elevated expression of this gene product in regions of the brain indicates that it plays a role in normal neural function. Potentially, this gene product is involved in synapse formation, neurotransmission, learning, cognition, homeostasis, or neuronal differentiation or survival. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:72 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1998 of SEQ ID NO:72, b is an integer of 15 to 2012, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:72, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 63

This gene is expressed primarily in bone marrow.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a

biological sample and for diagnosis of diseases and conditions which include, but are not limited to, leukemia, immune deficiency syndromes, and other immune related diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of diseases of bone marrow, such as leukemia, bone cancer and immune deficiency syndrome. Furthermore, the polypeptides or polynucleotides are also useful to enhance or protect proliferation, differentiation, and functional activation of hematopoietic progenitor cells (e.g., bone marrow cells), useful in treating cancer patients undergoing chemotherapy or patients undergoing bone marrow transplantation. The uses include bone marrow cell ex-vivo culture, bone marrow transplantation, bone marrow reconstitution, radiotherapy or chemotherapy of neoplasia. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:73 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1253 of SEQ ID NO:73, b is an integer of 15 to 1267, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:73, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 64

When tested against sensory neuron cell lines, supernatants removed from cells containing this gene activated the EGR1 assay. Thus, it is likely that this gene activates sensory neuronal cells through a signal transduction pathway. Early growth response 1 (EGR1) is a promoter associated with certain genes that induces various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation.

This gene is expressed primarily in the testes.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive system-related diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., testes, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in testes indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of reproductive system-related diseases. Furthermore, the tissue distribution indicates that polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of conditions concerning proper testicular function (e.g. endocrine function, sperm maturation), as well as cancer. Therefore, this gene product is useful in the treatment of male infertility and/or impotence. This gene product is also useful in assays designed to identify binding agents, as such agents (antagonists) are useful as male contraceptive agents. Similarly, the protein is believed to be useful in the treatment and/or diagnosis of testicular cancer. The testes are also a site of active gene expression of transcripts that may be expressed, particularly at low levels, in other tissues of the body. Therefore, this gene product may be expressed in other specific tissues or organs where it may play related functional roles in other processes, such as hematopoiesis, inflammation, bone formation, and kidney function, to name a few possible target indications.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:74 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1734 of SEQ ID NO:74, b is an integer of 15 to 1748, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:74, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 65

This gene is expressed primarily in synovial fibroblasts.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, rheumatoid arthritis. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The restricted tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of rheumatoid arthritis, since synovial fibroblasts are associated with the synovium and cartilage. In addition, the expression of this gene product in synovium indicates a role in the detection and treatment of disorders and conditions afflicting the skeletal system, in particular osteoporosis as well as disorders afflicting connective tissues (e.g. arthritis, trauma, tendonitis, chondromalacia and inflammation), such as in the diagnosis or treatment of various autoimmune disorders such as rheumatoid arthritis, lupus, scleroderma, and dermatomyositis as well as dwarfism, spinal deformation, and

specific joint abnormalities as well as chondrodysplasias (ie. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:75 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1556 of SEQ ID NO:75, b is an integer of 15 to 1570, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:75, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 66

This gene is expressed primarily in ovarian cancer, and to a lesser extent in fetal tissues such as fetal liver and fetal brain.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, cancers, particularly of the ovary. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., ovary, fetal, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:190 as residues: Pro-28 to Gln-33.

The tissue distribution in ovarian cancer tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of cancers; e.g., ovarian cancer, as well as other tissues where expression has been indicated. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:76 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 510 of SEQ ID NO:76, b is an integer of 15 to 524, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:76, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 67

This gene is expressed primarily in testes.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, male reproductive or hormonal related disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the male reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., testes, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:191 as residues: Pro-68 to Asp-73, Gln-92 to Glu-107, Gln-120 to Lys-126.

The tissue distribution in testes indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of male

reproductive or hormonal disorders. Furthermore, the tissue distribution indicates that polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of conditions concerning proper testicular function (e.g. endocrine function, sperm maturation), as well as cancer. Therefore, this gene product is useful in the treatment of male infertility and/or impotence. This gene product is also useful in assays designed to identify binding agents, as such agents (antagonists) are useful as male contraceptive agents. Similarly, the protein is believed to be useful in the treatment and/or diagnosis of testicular cancer. The testes are also a site of active gene expression of transcripts that may be expressed, particularly at low levels, in other tissues of the body. Therefore, this gene product may be expressed in other specific tissues or organs where it may play related functional roles in other processes, such as hematopoiesis, inflammation, bone formation, and kidney function, to name a few possible target indications. Protein, as well as, antibodies directed against the protein may show utility as a tissue-specific marker and/or immunotherapy target for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:77 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1292 of SEQ ID NO:77, b is an integer of 15 to 1306, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:77, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 68

When tested against U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

This gene is expressed primarily in human tonsils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., tonsils, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of immune disorders. Expression of this gene product in tonsils indicates a role in the regulation of the proliferation; survival; differentiation; and/or activation of potentially all hematopoietic cell lineages, including blood stem cells. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and psoriasis. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:78 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1465 of SEQ ID NO:78, b is an integer of 15 to 1479, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:78, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 69

10 This gene is expressed primarily in human thymus and six week old human embryo.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, endocrine diseases and leukemia. Similarly, polypeptides and antibodies
15 directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the endocrine and immune systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., endocrine, immune, cancerous and wounded
20 tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in thymus and developing embryonic tissues indicates
25 that polynucleotides and polypeptides corresponding to this gene are useful for the treatment of leukemia or other immune diseases, especially those which are involved in fetal development. Furthermore, the tissue distribution in thymus and developing embryonic tissues indicates that polynucleotides and polypeptides corresponding to this gene are useful for the detection, treatment, and/or prevention of various endocrine
30 disorders and cancers, particularly Addison's disease, Cushing's Syndrome, and disorders and/or cancers of the pancreas (e.g. diabetes mellitus), adrenal cortex, ovaries, pituitary (e.g., hyper-, hypopituitarism), thyroid (e.g. hyper-, hypothyroidism), parathyroid (e.g. hyper-, hypoparathyroidism), hypothalamus, and testes. Protein, as well as, antibodies directed against the protein may show utility as a
35 tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ

ID NO:79 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more
5 polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1780 of SEQ ID NO:79, b is an integer of 15 to 1794, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:79, and where b is greater than or equal to a + 14.

10

FEATURES OF PROTEIN ENCODED BY GENE NO: 70

This gene is expressed primarily in adult pulmonary tissue.

Therefore, polynucleotides and polypeptides of the invention are useful as
15 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, diseases of the cardiopulmonary system including asthma, bronchitis, apnea, enlarged heart, arrhythmia, strokes and heart attacks. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes
20 for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the cardiopulmonary system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., pulmonary, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell
25 sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:194 as residues: Pro-27 to Leu-41.

30 The tissue distribution in pulmonary tissues indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment or diagnosis of diseases such as arrhythmia, apnea, asthma and possibly for the early detection and prevention of patients likely to have strokes or heart attacks. Furthermore, the tissue distribution in pulmonary tissues indicates polynucleotides and polypeptides
35 corresponding to this gene are useful for the detection and treatment of disorders associated with developing lungs, particularly in premature infants where the lungs are the last tissues to develop. Additionally, the tissue distribution indicates polynucleotides

and polypeptides corresponding to this gene are useful for the diagnosis and intervention of lung tumors. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and immunotherapy targets for the above listed tumors and tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:80 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1266 of SEQ ID NO:80, b is an integer of 15 to 1280, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:80, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 71

When tested against K562 leukemia cell lines, supernatants removed from cells containing this gene activated the ISRE assay. Thus, it is likely that this gene activates leukemia cells through the Jak-STAT signal transduction pathway. The interferon-sensitive response element is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells.

Therefore, activation of the Jak-STAT pathway, reflected by the binding of the ISRE element, can be used to indicate proteins involved in the proliferation and differentiation of cells. Furthermore, contact of cells with supernatant expressing the product of this gene increases the permeability of THP-1 monocyte cells to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product of this gene binds a receptor on the surface of the monocyte cell. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating monocyte cells.

This gene is expressed primarily in adult human spleen and adult human testis.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune disorders. Similarly, polypeptides and antibodies directed to

these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., spleen, testes, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

10 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:195 as residues: Pro-32 to Gly-39.

The tissue distribution in spleen, in addition to the biological activity data, indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of immune disorders. Furthermore, this gene may play a role in the survival, proliferation, and/or differentiation of hematopoietic cells in general, and may be of use in the augmentation of the numbers of stem cells and committed progenitors. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:81 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 960 of SEQ ID NO:81, b is an integer of 15 to 974, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:81, and where b is greater than or equal to a + 14.

30

FEATURES OF PROTEIN ENCODED BY GENE NO: 72

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

35 ELISGLVIITAWIILCHSSSKNPVGGRIQLAIAIVITLFPFISWVYIYINKEMRSSWP
THCKTVI (SEQ ID NO:611), QCPQGTETEAGVSVPPRKEGGGPYVAGLTAPHVA
GLTAPRRVLRAMAPALWRACNGL (SEQ ID NO:612), HSSSKNPVGGRIQLA

IAIVITLFPFISWVYIY (SEQ ID NO:613), and/or RKEGGGPYVAGLTAPHVA
GLTAPRRVLRAMAP (SEQ ID NO:614). Polynucleotides encoding these
polypeptides are also encompassed by the invention.

This gene is expressed primarily in liver tissues, and to a lesser extent in t-cell
5 lymphoma.

Therefore, polynucleotides and polypeptides of the invention are useful as
reagents for differential identification of the tissue(s) or cell type(s) present in a
biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, hepatitis, sclerosis of the liver and cancer of the liver. Similarly,
10 polypeptides and antibodies directed to these polypeptides are useful in providing
immunological probes for differential identification of the tissue(s) or cell type(s). For a
number of disorders of the above tissues or cells, particularly of the immune system,
expression of this gene at significantly higher or lower levels may be routinely detected
in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily
15 fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or
cell sample taken from an individual having such a disorder, relative to the standard
gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an
individual not having the disorder.

The tissue distribution in liver indicates polynucleotides and polypeptides
20 corresponding to this gene are useful for the diagnosis and possible treatment of
diseases of the liver. Since it is primarily found in the liver, and with the additional
expression seen in T-cells, it most likely deals with the immune response in the liver,
for example to diseases like hepatitis, sclerosis and hepatocellular carcinoma. More
generally, the tissue distribution in liver indicates polynucleotides and polypeptides
25 corresponding to this gene are useful for the detection and treatment of liver disorders
and cancers (e.g. hepatoblastoma, jaundice, hepatitis, liver metabolic diseases and
conditions that are attributable to the differentiation of hepatocyte progenitor cells).
Protein, as well as, antibodies directed against the protein may show utility as a tumor
marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available
and accessible through sequence databases. Some of these sequences are related to SEQ
ID NO:82 and may have been publicly available prior to conception of the present
invention. Preferably, such related polynucleotides are specifically excluded from the
scope of the present invention. To list every related sequence is cumbersome.
30 Accordingly, preferably excluded from the present invention are one or more
polynucleotides comprising a nucleotide sequence described by the general formula of
a-b, where a is any integer between 1 to 1941 of SEQ ID NO:82, b is an integer of 15

to 1955, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:82, and where b is greater than or equal to a + 14.

5 FEATURES OF PROTEIN ENCODED BY GENE NO: 73

The gene encoding the disclosed cDNA is thought to reside on chromosome 10. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 10.

10 This gene is expressed primarily in myeloid progenitor cells, and to a lesser extent in leukemic cells and eosinophils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
15 not limited to, leukemia and other blood diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the hematopoiesis and immune systems, expression of this gene at significantly higher or lower levels may be routinely detected
20 in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

25 The tissue distribution in immune tissues indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of leukemia. Furthermore, the polypeptides or polynucleotides are also useful to enhance or protect proliferation, differentiation, and functional activation of hematopoietic progenitor cells (e.g., bone marrow cells), useful in treating cancer patients undergoing
30 chemotherapy or patients undergoing bone marrow transplantation. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ
35 ID NO:83 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 624 of SEQ ID NO:83, b is an integer of 15 to 638, where both a and b correspond to the positions of nucleotide residues shown in
5 SEQ ID NO:83, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 74

10 The translation product of this gene shares sequence homology with "neurogenic secreted signaling protein (brn)" (see gill1150971) from *Drosophila melanogaster* which is thought to be important in the normal development of brain tissue. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: PGRPTRPAXAGLSSGGAAQEAPQADPRPWLAR (SEQ ID
15 NO:615). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in the placenta and early embryonic tissue. Northern data has demonstrated that this gene is expressed in brain, stomach and colorectal adenocarcinoma.

20 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, several types of disorders of the brain including epilepsy, mood disorders, any of a variety of types of mental retardation, and addictive disorders
25 including alcoholism. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., brain,
30 stomach, colon, placental, embryonic, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

35 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:198 as residues: Gln-37 to Ala-42, Thr-51 to Ala-57, Pro-71 to His-79, Glu-124 to Arg-137, Ser-151 to Val-159.

The tissue distribution and homology to *Drosophila melanogaster* putative neurogenic secreted signaling protein (brn) indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment of various brain disorders as well as pre-natal testing for neuropathological conditions, such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, or sexually-linked disorders. Furthermore, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and/or treatment of disorders of the placenta. Specific expression within the placenta indicates that this gene product may play a role in the proper establishment and maintenance of placental function. Alternately, this gene product may be produced by the placenta and then transported to the embryo, where it may play a crucial role in the development and/or survival of the developing embryo or fetus. Expression of this gene product in a vascular-rich tissue such as the placenta also indicates that this gene product may be produced more generally in endothelial cells or within the circulation. In such instances, it may play more generalized roles in vascular function, such as in angiogenesis. It may also be produced in the vasculature and have effects on other cells within the circulation, such as hematopoietic cells. It may serve to promote the proliferation, survival, activation, and/or differentiation of hematopoietic cells, as well as other cells throughout the body. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:84 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 845 of SEQ ID NO:84, b is an integer of 15 to 859, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:84, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 75

5 The translation product of this gene shares sequence homology with a fat-specific secreted protein.

This gene is expressed primarily in the epididymus.

10 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, metabolic disorders and male infertility. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the metabolic and reproductive systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., epididymus, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

20 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:199 as residues: Tyr-21 to Asp-40, Ser-58 to Arg-64, Thr-71 to Ser-76, Ser-106 to Thr-112.

25 Homology to a fat-specific gene indicates that this gene may also play a role in the treatment and/or detection of metabolic disorders such as obesity, diabetes, anorexia nervosa and bulimia. In addition, its expression primarily in the epididymus indicates a role in the treatment/detection of male fertility disorders such as infertility, low sperm count, spermatorrhea and spermiation. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

30 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:85 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

35 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1115 of SEQ ID NO:85, b is an integer of 15

to 1129, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:85, and where b is greater than or equal to a + 14.

5 FEATURES OF PROTEIN ENCODED BY GENE NO: 76

The translation product of this gene shares sequence homology with Slit, a secreted *Drosophila* protein which plays a role in the development of axon pathway development in the central nervous system. The Slit protein is necessary for the normal development of the midline of the CNS, particularly the midline glial cells, and for the concomitant formation of the commissural axon pathways. The process is dependent on the level of SLIT protein expression. It appears that the SLIT protein is excreted by the midline glial cells, where it is synthesised and is eventually associated with the surfaces of axons that traverse them. Contact of cells with supernatant expressing the product of this gene increases the permeability of THP-1 monocyte cells to calcium. Thus, it is likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product of this gene binds a receptor on the surface of the monocyte cell. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating monocyte cells. Furthermore, when tested against U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

This gene is expressed primarily in infant brain, and to a lesser extent in adult cerebellum and frontal cortex.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neurological disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell

types (e.g., cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:200 as residues: Glu-25 to Lys-33, Glu-115 to Lys-120.

The tissue distribution primarily in brain and homology to Slit, a gene involved in axon pathway development, indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment/detection of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, spinal cord injury, brain injuries, crushed (optic) nerve, amyotrophic lateral sclerosis, diabetes caused nerve damage, strokes, epilepsy, multiple sclerosis, paraplegia retinal degeneration, Huntingtons Disease, facial nerve damage, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder and panic disorder. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:86 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 2660 of SEQ ID NO:86, b is an integer of 15 to 2674, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:86, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 77

The translation product of this gene shares sequence homology with human endothelial cell multimerin, which is a secreted protein that binds to the extracellular matrix and is thought to be involved in hemostasis. Multimerin is a factor V/Va-binding protein and may function as a carrier protein for platelet factor V (J. Biol Chem 1995 Aug 4;270(31):18246-51). Contact of cells with supernatant expressing the product of this gene increases the permeability of THP-1 Monocyte cells to calcium. Thus, it is

likely that the product of this gene is involved in a signal transduction pathway that is initiated when the product of this gene binds a receptor on the surface of the monocyte cell. Thus, polynucleotides and polypeptides have uses which include, but are not limited to, activating monocyte cells.

5 This gene is expressed primarily in a variety of hematopoietic cells including T-cells, dendritic cells and B-cells as well as cells and tissues of epithelial and endothelial origin including healing wounds and keratinocytes, as well as placenta.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a
10 biological sample and for diagnosis of diseases and conditions which include, but are not limited to, acute internal injury, blood clotting disorders and other disorders of hemostasis. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of
15 the hemostasis, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., endothelial, immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in
20 healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:201 as residues: Ala-43 to Trp-57, Ser-81 to Gly-88, Tyr-125 to Asp-134, Pro-141 to Gly-154, Val-172 to Glu-178, Lys-296 to Gly-305, Leu-307 to Arg-314, Thr-335 to His-341.

25 The tissue distribution in endothelial tissues, and the homology to human endothelial cell multimerin, indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and/or treatment of disorders involving the vasculature. Elevated expression of this gene product by endothelial cells indicates that it may play vital roles in the regulation of endothelial cell function; secretion;
30 proliferation; or angiogenesis. Furthermore, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and/or treatment of disorders of the placenta. Specific expression within the placenta indicates that this gene product may play a role in the proper establishment and maintenance of placental function. Alternately, this gene product may be produced by
35 the placenta and then transported to the embryo, where it may play a crucial role in the development and/or survival of the developing embryo or fetus. Expression of this gene product in a vascular-rich tissue such as the placenta also indicates that this gene

product may be produced more generally in endothelial cells or within the circulation. In such instances, it may play more generalized roles in vascular function, such as in angiogenesis. It may also be produced in the vasculature and have effects on other cells within the circulation, such as hematopoietic cells, as supported by the biological activity data mentioned previously. It may serve to promote the proliferation, survival, activation, and/or differentiation of hematopoietic cells, as well as other cells throughout the body. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:87 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1622 of SEQ ID NO:87, b is an integer of 15 to 1636, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:87, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 78

In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

HYXSTPGRVPVRQFAAASTSGGPWVPGGXLEAPFQVAPSLSHSTPVFPGLI (SEQ ID NO:616). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in osteoblasts.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, degenerative conditions of the bone including arthritis and osteoporosis. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the skeletal system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., skeletal, cancerous and wounded

tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

5 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:202 as residues: Thr-45 to Cys-50, Met-55 to Pro-60.

The tissue distribution in osteoblasts indicates polynucleotides and polypeptides corresponding to this gene are useful for treating degenerative conditions of the bone mediated by alterations in the activity ratio of osteoblasts and osteoclasts. Furthermore, elevated levels of expression of this gene product in osteoblastoma indicates that it may play a role in the survival, proliferation, and/or growth of osteoblasts. Therefore, it may be useful in influencing bone mass in such conditions as osteoporosis. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

15 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:88 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

20 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1625 of SEQ ID NO:88, b is an integer of 15 to 1639, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:88, and where b is greater than or equal to a + 14.

25

FEATURES OF PROTEIN ENCODED BY GENE NO: 79

The gene encoding the disclosed cDNA is thought to reside on chromosome 17. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 17. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: ARGKYESAQPGGTQPEPGLGAR (SEQ ID NO:617). Polynucleotides encoding these polypeptides are also encompassed by the invention.

35 This gene is expressed primarily in pituitary, cerebellum and kidney and to a lesser extent in a range of fetal tissues including lung, heart and spleen.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, metabolic, neurological, and renal disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the endocrine, renal and nervous systems expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., kidney, fetal, brain, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:203 as residues: Pro-29 to Gly-34, Gln-79 to Arg-84, Arg-146 to Arg-152, Ser-183 to Ser-193, Gly-233 to His-241, Tyr-265 to Pro-278, Thr-304 to Arg-320, Leu-328 to Gly-333, Glu-385 to Arg-399.

The high expression of a secreted gene in the pituitary indicates a role for this gene or gene product in the treatment/detection of metabolic disorders associated with the endocrine system, such as growth and developmental defects. Expression in the cerebellum indicates a role in the treatment/detection of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder and panic disorder. Expression in the kidney indicates a role in the treatment/detection of renal disorders such as kidney failure, Wilms Tumor and kidney stones, as well as nephritis, renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and congenital kidney abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. .

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:89 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1846 of SEQ ID NO:89, b is an integer of 15 to 1860, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:89, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 80

10 The translation product of this gene shares sequence homology with ras-related proteins in rats which is thought to be involved in cellular signaling.

This gene is expressed primarily in T-cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, immune system disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

25 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:204 as residues: Met-40 to Thr-46, Ala-57 to Glu-64, Ser-85 to Leu-91.

The tissue distribution in immune system tissues indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of a variety of immune system disorders. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and psoriasis. In addition, this gene product may have commercial utility

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in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Expression of this gene product in T cells also strongly indicates a role for this protein in immune function and immune surveillance. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:90 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 825 of SEQ ID NO:90, b is an integer of 15 to 839, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:90, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 81

When tested against U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

This gene is expressed primarily in fetal liver, osteoclastoma and neutrophils.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, diseases of the bone, haemopoietic system and cancer. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune,

haemopoietic and bone, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, skeletal, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having
5 such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in fetal liver, osteoclastoma and neutrophils indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of diseases of the bone, haemopoietic and immune systems, as well as
10 cancer. Furthermore, elevated levels of expression of this gene product in osteoclastoma indicates that it may play a role in the survival, proliferation, and/or growth of osteoclasts. Therefore, it may be useful in influencing bone mass in such conditions as osteoporosis. More generally, as evidenced by expression in fetal liver/spleen, as well as the biological activity data, this gene may play a role in the
15 survival, proliferation, and/or differentiation of hematopoietic cells in general, and may be of use in the augmentation of the numbers of stem cells and committed progenitors. Expression of this gene product in neutrophils also indicates that it may play a role in mediating responses to infection and controlling immunological responses, such as those that occur during immune surveillance. Protein, as well as, antibodies directed
20 against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:91 and may have been publicly available prior to conception of the present
25 invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1131 of SEQ ID NO:91, b is an integer of 15
30 to 1145, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:91, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 82

This gene is expressed primarily in endometrial stromal cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, female infertility. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., reproductive, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:206 as residues: Gln-26 to Asn-51.

The tissue distribution in endometrial cells indicates polynucleotides and polypeptides corresponding to this gene are useful for treating female infertility. The protein product is likely involved in preparation of the endometrium of implantation and could be administered either topically or orally. Alternatively, this gene could be transfected in gene-replacement treatments into the cells of the endometrium and the protein products could be produced. Similarly, these treatments could be performed during artificial insemination for the purpose of increasing the likelihood of implantation and development of a healthy embryo. In both cases this gene or its gene product could be administered at later stages of pregnancy to promote healthy development of the endometrium. Protein, as well as, antibodies directed against the protein may show utility as a tissue-specific marker and/or immunotherapy target for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:92 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 2036 of SEQ ID NO:92, b is an integer of 15 to 2050, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:92, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 83

5 The gene encoding the disclosed cDNA is thought to reside on chromosome 19. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 19.

 This gene is expressed primarily in tissues of the central nervous system (predominantly the cerebellum) and immune system (predominantly the tonsils).

10 Nucleic acids of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, disorders of the immune system and CNS. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the
15 tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system and neurological system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, neurological, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell
20 sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

 Preferred epitopes include those comprising a sequence shown in SEQ ID NO:207 as residues: Pro-43 to Leu-49, Pro-61 to Gly-66, Ser-71 to Ser-83.

25 The tissue distribution in the immune system indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of a variety of immune system disorders. Expression of this gene product in tonsils indicates a role in the regulation of the proliferation; survival; differentiation; and/or activation of potentially all hematopoietic cell lineages, including blood stem cells. This
30 gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed
35 tissues. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and psoriasis. In

addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Furthermore, the tissue distribution in the central nervous system indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, or sexually-linked disorders. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:93 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1159 of SEQ ID NO:93, b is an integer of 15 to 1173, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:93, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 84

This gene is expressed primarily in testes.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, reproductive disorders and testes diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the testes, expression of this gene at

significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., testes, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:208 as residues: Lys-28 to His-35, Asn-58 to Gly-64, Thr-80 to Asn-86, Pro-96 to Glu-111, Pro-124 to Phe-133.

The tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of testes disorders. Furthermore, the tissue distribution in testes indicates that polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of conditions concerning proper testicular function (e.g. endocrine function, sperm maturation), as well as cancer. Therefore, this gene product is useful in the treatment of male infertility and/or impotence. This gene product is also useful in assays designed to identify binding agents, as such agents (antagonists) are useful as male contraceptive agents. Similarly, the protein is believed to be useful in the treatment and/or diagnosis of testicular cancer. The testes are also a site of active gene expression of transcripts that may be expressed, particularly at low levels, in other tissues of the body. Therefore, this gene product may be expressed in other specific tissues or organs where it may play related functional roles in other processes, such as hematopoiesis, inflammation, bone formation, and kidney function, to name a few possible target indications. Protein, as well as, antibodies directed against the protein may show utility as a tissue-specific marker and/or immunotherapy target for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:94 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 808 of SEQ ID NO:94, b is an integer of 15 to 822, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:94, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 85

This gene is expressed primarily in infant brain, bone marrow and activated T-cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, developmental, immune and hematopoietic disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune, hematopoietic and developmental systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, developmental, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:209 as residues: Asn-23 to Val-37.

Expression in infant brain indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of mental retardation and other developmental disorders in addition to neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder and panic disorder. Expression of the gene in bone marrow and in B-cells indicates a role in the treatment and/or detection of immune disorders such as arthritis, asthma, immunodeficiency diseases and leukemia. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:95 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1063 of SEQ ID NO:95, b is an integer of 15 to 1077, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:95, and where b is greater than or equal to a + 14.

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FEATURES OF PROTEIN ENCODED BY GENE NO: 86

The gene encoding the disclosed cDNA is thought to reside on chromosome 1. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 1. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence: SCGSSRRSAKRSLTLKLIDFSHRI (SEQ ID NO:618). Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in infant brain, fetal liver and fetal spleen, and to a lesser extent in macrophages, T-cells, erythroid cells and myeloid progenitor cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neurological, developmental and immune disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the nervous, immune and developmental systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, neurological, developing, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:210 as residues: Val-34 to Leu-48, Val-51 to Gly-67, Lys-74 to Asp-81, Thr-93 to Glu-98, Ser-138 to His-149, Ala-186 to Gln-201, Pro-257 to Arg-271.

Expression in infant brain indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of mental retardation and other developmental disorders in addition to neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons

Disease, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder and panic disorder. Its distribution in fetal liver and fetal spleen indicates that this gene may play a role in the development of the hematopoietic and immune systems and that it may play a role in the treatment/detection of immune system disorders such as leukemia, arthritis and asthma. Protein, as well as, antibodies directed against the protein may show utility as a tissue-specific marker and/or immunotherapy target for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:96 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 2078 of SEQ ID NO:96, b is an integer of 15 to 2092, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:96, and where b is greater than or equal to a + 14.

20 FEATURES OF PROTEIN ENCODED BY GENE NO: 87

This gene is expressed primarily in hippocampus, and to a lesser extent in fetal heart.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, any of a variety of brain disorders including epilepsy, stroke, palsy, and mood disorders including unipolar and bipolar depression. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., brain, heart, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in hippocampus indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning disabilities, epilepsy, stroke, palsy, and mood disorders including unipolar and bipolar depression, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, or sexually-linked disorders. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:97 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1338 of SEQ ID NO:97, b is an integer of 15 to 1352, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:97, and where b is greater than or equal to a + 14.

25 FEATURES OF PROTEIN ENCODED BY GENE NO: 88

The translation product of this gene shares sequence homology with a *C. elegans* protein (coded for by *C. elegans* cDNA yk112f3.5). The gene encoding the disclosed cDNA is thought to reside on chromosome 3. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 3. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

HYFLRTVSGLSVVPVSLRCCMCPPPCTGPAPATAHSPFDPPALPIQFEYQQA

(SEQ ID NO:619), QLEAEIENLSWKVERADSYDRGDLENQMHI AEQRRRT

35 LLKDFHDT (SEQ ID NO:620), VPVSLRCCMCPPPCTGPAPATAHS (SEQ ID NO:621), and/or SWKVERADSYDRGDLENQMHI AEQR (SEQ ID NO:622).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in fetal liver and spleen.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, congenital disorders of the liver and spleen. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the hepatic system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, hepatic, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in fetal liver and spleen indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection and treatment of liver disorders and cancers (e.g. hepatoblastoma, jaundice, hepatitis, liver metabolic diseases and conditions that are attributable to the differentiation of hepatocyte progenitor cells). More generally, as evidenced by expression in fetal liver/spleen, this gene may play a role in the survival, proliferation, and/or differentiation of hematopoietic cells in general, and may be of use in augmentation of the numbers of stem cells and committed progenitors. Expression of this gene product in primary dendritic cells also indicates that it may play a role in mediating responses to infection and controlling immunological responses, such as those that occur during immune surveillance. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:98 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 899 of SEQ ID NO:98, b is an integer of 15 to 913, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:98, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 89

5 This gene is expressed primarily in neutrophils.

 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, acute immunological disorders such as inflammation. Similarly,
10 polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily
15 fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

 The tissue distribution in neutrophils indicates polynucleotides and polypeptides
20 corresponding to this gene are useful for treating an acute inflammatory response. Furthermore, this gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies
25 directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and psoriasis. In addition, this gene product may have commercial utility in the expansion
30 of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Expression of this gene product in neutrophils also strongly indicates a role for this protein in immune function and immune surveillance. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed
35 tissues.

 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ

ID NO:99 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more

- 5 polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 707 of SEQ ID NO:99, b is an integer of 15 to 721, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:99, and where b is greater than or equal to a + 14.

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FEATURES OF PROTEIN ENCODED BY GENE NO: 90

When tested against U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates
15 myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells.

- 20 Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

This gene is expressed primarily in fetal liver and fetal spleen.

- Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a
25 biological sample and for diagnosis of diseases and conditions which include, but are not limited to, developmental and/or immune disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune and developmental systems,
30 expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., liver, spleen, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily
35 fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:214 as residues: His-23 to Leu-31, His-33 to Pro-41.

The distribution of this gene in fetal liver and fetal spleen and the biological activity data indicates it may play a role in the development of the immune and hematopoietic systems. It may, therefore, play a role in the treatment and/or detection of immune and/or hematopoietic disorders including leukemia, arthritis and asthma.

5 Furthermore, this gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Therefore it may be also used as an agent for
10 immunological disorders including arthritis, asthma, immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and psoriasis. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the
15 differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ
20 ID NO:100 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of
25 a-b, where a is any integer between 1 to 631 of SEQ ID NO:100, b is an integer of 15 to 645, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:100, and where b is greater than or equal to a + 14.

30 FEATURES OF PROTEIN ENCODED BY GENE NO: 91

This gene is expressed primarily in brain and osteoclastoma to a lesser extent in placenta.

Therefore, polynucleotides and polypeptides of the invention are useful as
35 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neurological, bone and reproductive disorders. Similarly, polypeptides

and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the nervous, bone and reproductive systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., skeletal, brain, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:215 as residues: Phe-47 to Cys-54.

Expression of this gene in brain indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder and panic disorder. Furthermore, expression in osteoclastoma indicates a role in the treatment and/or detection of bone damage such as fractures and dislocations. Elevated levels of expression of this gene product in osteoclastoma indicates that it may play a role in the survival, proliferation, and/or growth of osteoclasts. Therefore, it may be useful in influencing bone mass in such conditions as osteoporosis. Expression in the placenta indicates a role in the treatment and/or detection of pregnancy disorders such as miscarriage, birth defects, premature birth, in addition to disorders such as placenta previa and placentitis. Specific expression within the placenta indicates that this gene product may play a role in the proper establishment and maintenance of placental function. Alternately, this gene product may be produced by the placenta and then transported to the embryo, where it may play a crucial role in the development and/or survival of the developing embryo or fetus. Expression of this gene product in a vascular-rich tissue such as the placenta also indicates that this gene product may be produced more generally in endothelial cells or within the circulation. In such instances, it may play more generalized roles in vascular function, such as in angiogenesis. It may also be produced in the vasculature and have effects on other cells within the circulation, such as hematopoietic cells. It may serve to promote the proliferation, survival, activation, and/or differentiation of hematopoietic cells, as well as other cells throughout the body. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:101 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 549 of SEQ ID NO:101, b is an integer of 15 to 563, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:101, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 92

This gene is expressed primarily in T-cells, bone marrow, fetal liver/spleen and and to a lesser extent in adipocytes, kidney, melanocytes and stimulated fibroblasts.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, hematopoietic disease characterized by alterations in T cells. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in immune tissues indicates polynucleotides and polypeptides corresponding to this gene are useful for treating autoimmune diseases or proliferative disorders of the developing immune system. This gene product is primarily expressed in hematopoietic cells and tissues, suggesting that it plays a role in the survival, proliferation, and/or differentiation of hematopoietic lineages. This is particularly supported by the expression of this gene product in fetal liver and bone marrow, the two primary sites of definitive hematopoiesis. Expression of this gene product in T cells also strongly indicates a role for this protein in immune function and

immune surveillance. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues:

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:102 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1310 of SEQ ID NO:102, b is an integer of 15 to 1324, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:102, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 93

The gene encoding the disclosed cDNA is thought to reside on chromosome 4. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 4.

This gene is expressed primarily in fetal tissues including fetal liver/spleen and to a lesser extent in lung, bone marrow, adrenal gland tumor and in the Ntera2 cell line.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, cancers. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the adrenal gland or lungs, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., developing tissues, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in fetal and developing tissues indicates polynucleotides and polypeptides corresponding to this gene are useful for treating tumors formed by

poorly differentiated cells, as well as tumors of other tissues where expression has been observed. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:103 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1717 of SEQ ID NO:103, b is an integer of 15 to 1731, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:103, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 94

This gene is expressed primarily in the prostate derived cell line PC3 and fetal liver/spleen.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, prostatic hypertrophy or prostate cancer. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the glandular tissues, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., prostate, immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:218 as residues: Leu-26 to Ser-33.

The tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for treating diseases of the prostate including prostatic tumors or benign prostatic hypertrophy. Protein, as well as, antibodies

directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:104 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1452 of SEQ ID NO:104, b is an integer of 15 to 1466, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:104, and where b is greater than or equal to a + 14.

15 FEATURES OF PROTEIN ENCODED BY GENE NO: 95

This gene is expressed primarily in small intestine, and to a lesser extent in breast tissue.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, diseases of the small intestine. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the small intestine, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., small intestine, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:219 as residues: Glu-37 to Gly-45.

The tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of diseases involving the small intestine, such as cancer of the small intestine or other tissues where expression has been indicated. Protein, as well as, antibodies directed against the

protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:105 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1289 of SEQ ID NO:105, b is an integer of 15 to 1303, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:105, and where b is greater than or equal to a + 14.

15 FEATURES OF PROTEIN ENCODED BY GENE NO: 96

This gene is expressed primarily in fast-growing tissues such as tumor and fetal tissues.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, growth disorders such as tumorigenesis and growth retardation. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the fast-growing tissues, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., rapidly proliferating cells, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:220 as residues: Phe-32 to Cys-37.

The tissue distribution in rapidly-proliferating tissues and cells indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of growth disorders. Furthermore, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are

useful for the diagnosis and treatment of cancer and other proliferative disorders. Expression within embryonic tissue and other cellular sources marked by proliferating cells indicates that this protein may play a role in the regulation of cellular division. Similarly, embryonic development also involves decisions involving cell differentiation and/or apoptosis in pattern formation. Thus, this protein may also be involved in apoptosis or tissue differentiation and could again be useful in cancer therapy. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:106 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1502 of SEQ ID NO:106, b is an integer of 15 to 1516, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:106, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 97

When tested against Jurkat T-cells and U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates both T-cells and myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

This gene is expressed primarily in placenta, and to a lesser extent in the endometrium.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, pregnancy disorders. Similarly, polypeptides and antibodies directed to

these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the female reproductive system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., placental, reproductive, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Expression of this gene in the placenta and endometrium indicates a role in the treatment and/or detection of pregnancy disorders such as miscarriage, birth defects, premature birth, in addition to disorders such as endometriosis, placenta previa and placentitis. Furthermore, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and/or treatment of disorders of the placenta. Specific expression within the placenta indicates that this gene product may play a role in the proper establishment and maintenance of placental function. Alternately, this gene product may be produced by the placenta and then transported to the embryo, where it may play a crucial role in the development and/or survival of the developing embryo or fetus. Expression of this gene product in a vascular-rich tissue such as the placenta also indicates that this gene product may be produced more generally in endothelial cells or within the circulation. In such instances, it may play more generalized roles in vascular function, such as in angiogenesis. It may also be produced in the vasculature and have effects on other cells within the circulation, such as hematopoietic cells. It may serve to promote the proliferation, survival, activation, and/or differentiation of hematopoietic cells, as well as other cells throughout the body. Alternatively, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for treating female infertility. The protein product is likely involved in preparation of the endometrium of implantation and could be administered either topically or orally. Alternatively, this gene could be transfected in gene-replacement treatments into the cells of the endometrium and the protein products could be produced. Similarly, these treatments could be performed during artificial insemination for the purpose of increasing the likelihood of implantation and development of a healthy embryo. In both cases this gene or its gene product could be administered at later stages of pregnancy to promote healthy development of the endometrium. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:107 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1675 of SEQ ID NO:107, b is an integer of 15 to 1689, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:107, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 98

The gene encoding the disclosed cDNA is thought to reside on chromosome 5. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 5. Recently another group gened and sequenced this gene, calling it MDC-3.13 isoform 1 (Genbank Accession Number: g3860095), which is believed to be a cellular factor involved in the differentiation of dendritic cells. In specific embodiments, polypeptides of the invention comprise the following amino acid sequence:

HEAWLRSAGTREPPREQRTRRRQTAQLALQVPAPSRTPPMATDVFNSKNLAVX
 AQKKILGKMVSKSIATTLIDDSSEVLDELYRVTREYQTQNKKEAEKIIKNLIKTVI
 KLAILYRNNQFNQDELALMEKFKKKVHQLAMTVVSFHQVDYTFDRNVLSRLL
 NECREMLHQIIQRHLTAKSHGRVNNVFDHFSDFLAALYNPFGNFKPHLQKL
 CDGINKMLDEENI (SEQ ID NO:623), HEAWLRSAGTREPPREQRTRRRQTAQLA
 LQVPAPSRTPPMATDVFNSKNLAV (SEQ ID NO:624), XAQKKILGKMVSKSIAT
 TLIDDSSEVLDELYRVTREYQTQNKKEAEKII (SEQ ID NO:625), KNLIKTVIKLA
 ILYRNNQFNQDELALMEKFKKKVHQLAMTVVSFHQVDYTF (SEQ ID NO:626),
 DRNVLSRLLNECREMLHQIIQRHLTAKSHGRVNNVFDHFSDFLAALYNPF
 (SEQ ID NO:627), and/or GNFKPHLQKLCDGINKMLDEENI (SEQ ID NO:628).

Polynucleotides encoding these polypeptides are also encompassed by the invention.

This gene is expressed primarily in placenta, spleen from CLL patients and various T cell libraries, and to a lesser extent in lung, bone marrow, neutrophil, osteoclastoma, and lymphoma tissues.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a

biological sample and for diagnosis of diseases and conditions which include, but are not limited to, diseases of the blood particularly diseases afflicting T cells and tumors of blood cells. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the hematopoietic system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., placental, immune, vascular, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in immune tissues indicates polynucleotides and polypeptides corresponding to this gene are useful for treating diseases of the blood including leukemias, lymphomas and diseases that alter T-cell function or proliferation. Furthermore, the tissue distribution in placenta indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and/or treatment of disorders of the placenta. Specific expression within the placenta indicates that this gene product may play a role in the proper establishment and maintenance of placental function. Alternately, this gene product may be produced by the placenta and then transported to the embryo, where it may play a crucial role in the development and/or survival of the developing embryo or fetus. Expression of this gene product in a vascular-rich tissue such as the placenta also indicates that this gene product may be produced more generally in endothelial cells or within the circulation. In such instances, it may play more generalized roles in vascular function, such as in angiogenesis. It may also be produced in the vasculature and have effects on other cells within the circulation, such as hematopoietic cells. It may serve to promote the proliferation, survival, activation, and/or differentiation of hematopoietic cells, as well as other cells throughout the body. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:108 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more

polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1929 of SEQ ID NO:108, b is an integer of 15 to 1943, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:108, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 99

This gene is expressed primarily in rejected kidney, placenta, and melanocytes.

10 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, acute or chronic renal failure. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for
15 differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the renal system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., renal, placental, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample
20 taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:223 as residues: Thr-41 to Pro-47.

25 The tissue distribution in kidney indicates polynucleotides and polypeptides corresponding to this gene are useful for treating diseases of the kidney, including renal failure of either an acute or chronic nature, as well as nephritis, renal tubular acidosis, proteinuria, pyuria, edema, pyelonephritis, hydronephritis, nephrotic syndrome, crush syndrome, glomerulonephritis, hematuria, renal colic and kidney stones, in addition to
30 Wilms Tumor Disease, and congenital kidney abnormalities such as horseshoe kidney, polycystic kidney, and Falconi's syndrome. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

35 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:109 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the

scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1580 of SEQ ID NO:109, b is an integer of 15
5 to 1594, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:109, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 100

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When tested against U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which
15 are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

20

This gene is expressed primarily in spinal cord, and to a lesser extent in melanocytes and fetal spleen/liver.

25

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are
25 not limited to, central nervous system diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues
30 or cell types (e.g., central nervous system, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

35

The tissue distribution in spinal cord tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of central nervous system disorders, such as Alzheimers Disease, Parkinsons Disease,

Huntingtons Disease, Tourette Syndrome, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, or sexually-linked disorders. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:110 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1728 of SEQ ID NO:110, b is an integer of 15 to 1742, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:110, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 101

This gene is expressed primarily in breast and dendritic cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, breast related disorders and inflammatory diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the breast tissue and dendritic cells, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., breast, immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in breast indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of breast related diseases and inflammatory disorders. Furthermore, the tissue distribution in breast indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and intervention of breast tumors, in addition to other tumors where expression has been indicated. Protein, as well as, antibodies directed against the protein may show utility as a tissue-specific marker and/or immunotherapy target for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:111 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1487 of SEQ ID NO:111, b is an integer of 15 to 1501, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:111, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 102

When tested against sensory neuron cell lines, supernatants removed from cells containing this gene activated the EGR1 assay. Thus, it is likely that this gene activates neuronal cells through a signal transduction pathway. Early growth response 1 (EGR1) is a promoter associated with certain genes that induces various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. Furthermore, when tested against both Jurkat T-cells and U937 Myeloid cell lines, supernatants removed from cells containing this gene activated the GAS assay. Thus, it is likely that this gene activates both T-cells and myeloid cells through the Jak-STAT signal transduction pathway. The gamma activating sequence (GAS) is a promoter element found upstream of many genes which are involved in the Jak-STAT pathway. The Jak-STAT pathway is a large, signal transduction pathway involved in the differentiation and proliferation of cells. Therefore, activation of the Jak-STAT pathway, reflected by the binding of the GAS element, can be used to indicate proteins involved in the proliferation and differentiation of cells.

This gene is expressed primarily in synovial sarcoma.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, synovial sarcoma. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the synovial sarcoma, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., synovium, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

The tissue distribution in synovial sarcoma, and the biological activity data, suggest that polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of synovial sarcoma. In general, the expression of this gene product in synovium indicates a role in the detection and treatment of disorders and conditions afflicting the skeletal system, in particular osteoporosis as well as disorders afflicting connective tissues (e.g. arthritis, trauma, tendonitis, chondromalacia and inflammation), such as in the diagnosis or treatment of various autoimmune disorders such as rheumatoid arthritis, lupus, scleroderma, and dermatomyositis as well as dwarfism, spinal deformation, and specific joint abnormalities as well as chondrodysplasias (ie. spondyloepiphyseal dysplasia congenita, familial osteoarthritis, Atelosteogenesis type II, metaphyseal chondrodysplasia type Schmid). Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:112 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 777 of SEQ ID NO:112, b is an integer of 15 to 791, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:112, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 103

This gene is expressed primarily in human tonsils.

Therefore, polynucleotides and polypeptides of the invention are useful as
5 reagents for differential identification of the tissue(s) or cell type(s) present in a
biological sample and for diagnosis of diseases and conditions which include, but are
not limited to, relating to inflammatory diseases such as tonsillitis, and immune system
disorders. Similarly, polypeptides and antibodies directed to these polypeptides are
10 useful in providing immunological probes for differential identification of the tissue(s)
or cell type(s). For a number of disorders of the above tissues or cells, particularly of
the immune system, expression of this gene at significantly higher or lower levels may
be routinely detected in certain tissues or cell types (e.g., immune, cancerous and
wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal
15 fluid) or another tissue or cell sample taken from an individual having such a disorder,
relative to the standard gene expression level, i.e., the expression level in healthy tissue
or bodily fluid from an individual not having the disorder.

The tissue distribution in tonsils indicates polynucleotides and polypeptides
corresponding to this gene are useful for the diagnosis, treatment, and/or prevention of
lymphoid tissue disorders such as tonsillitis. Furthermore, the tissue distribution
20 indicates polynucleotides and polypeptides corresponding to this gene are useful for the
diagnosis and treatment of a variety of immune system disorders. Expression of this
gene product in tonsils indicates a role in the regulation of the proliferation; survival;
differentiation; and/or activation of potentially all hematopoietic cell lineages, including
blood stem cells. This gene product may be involved in the regulation of cytokine
25 production, antigen presentation, or other processes that may also suggest a usefulness
in the treatment of cancer (e.g. by boosting immune responses). Since the gene is
expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies
directed against the protein may show utility as a tumor marker and/or immunotherapy
targets for the above listed tissues. Therefore it may be also used as an agent for
30 immunological disorders including arthritis, asthma, immune deficiency diseases such
as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and
psoriasis. In addition, this gene product may have commercial utility in the expansion
of stem cells and committed progenitors of various blood lineages, and in the
differentiation and/or proliferation of various cell types. Protein, as well as, antibodies
35 directed against the protein may show utility as a tumor marker and/or immunotherapy
targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:113 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of $a-b$, where a is any integer between 1 to 1623 of SEQ ID NO:113, b is an integer of 15 to 1637, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:113, and where b is greater than or equal to $a + 14$.

FEATURES OF PROTEIN ENCODED BY GENE NO: 104

This gene is expressed primarily in activated T-cells and prostate tissue.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, T lymphocytes related diseases and inflammation of the prostate.

Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune and reproductive systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune, reproductive, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:228 as residues: Arg-24 to Trp-36.

The tissue distribution in immune system tissues and prostate tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of immune and reproductive disorders. This gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin,

the gene or protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis,

5 inflammatory bowel disease, sepsis, acne, and psoriasis. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Expression of this gene product in T cells also strongly indicates a role for this protein in immune function and immune surveillance. Protein, as well as, antibodies
10 directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:114 and may have been publicly available prior to conception of the present
15 invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1574 of SEQ ID NO:114, b is an integer of 15
20 to 1588, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:114, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 105

25

This gene is expressed primarily in human adult pulmonary tissue and infant brain.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a
30 biological sample and for diagnosis of diseases and conditions which include, but are not limited to, relating to the lung, neurological and immunological disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the
35 respiratory, nervous, and immune systems expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., pulmonary, immune, nervous, cancerous and wounded tissues) or bodily fluids (e.g.,

serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

5 The tissue distribution in pulmonary tissue and infant brain tissue indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment for disorders relating to the pulmonary system, the central nervous system, and the immune system. Furthermore, the tissue distribution in pulmonary tissue and fetal tissue indicates polynucleotides and polypeptides
10 corresponding to this gene are useful for the detection and treatment of disorders associated with developing lungs, particularly in premature infants where the lungs are the last tissues to develop. The tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and intervention of lung tumors, since the gene may be involved in the regulation of cell division.
15 Additionally, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning disabilities, ALS,
20 psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, or sexually-linked disorders. Also, this gene product may be involved in the regulation of cytokine production, antigen presentation, or other
25 processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma,
30 immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and psoriasis. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a
35 tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ

ID NO:115 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more

- 5 polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1912 of SEQ ID NO:115, b is an integer of 15 to 1926, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:115, and where b is greater than or equal to a + 14.

10

FEATURES OF PROTEIN ENCODED BY GENE NO: 106

The translation product of this gene shares sequence homology with the KIAA0132 gene product, and also shares homology to *Drosophila melanogaster* ring canel protein. The gene encoding the disclosed cDNA is thought to reside on chromosome 1. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 1.

This gene is expressed primarily in infant brain and B-cell lymphoma.

- 15 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, relating to the central nervous system and B cell disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the central nervous and immune systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., central nervous system, immune, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:230 as residues: Thr-31 to Trp-42, Gly-49 to His-54, Gly-68 to Glu-75, Ser-77 to Trp-89, Met-142 to Gly-148.

- 35 The tissue distribution in infant brain and B-cell lymphomas indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis, treatment, and/or prevention for central nervous system and immune

disorders. Furthermore, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome, schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, or sexually-linked disorders. Additionally, this gene product may be involved in the regulation of cytokine production, antigen presentation, or other processes that may also suggest a usefulness in the treatment of cancer (e.g. by boosting immune responses). Since the gene is expressed in cells of lymphoid origin, the gene or protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues. Therefore it may be also used as an agent for immunological disorders including arthritis, asthma, immune deficiency diseases such as AIDS, leukemia, rheumatoid arthritis, inflammatory bowel disease, sepsis, acne, and psoriasis. In addition, this gene product may have commercial utility in the expansion of stem cells and committed progenitors of various blood lineages, and in the differentiation and/or proliferation of various cell types. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:116 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of $a-b$, where a is any integer between 1 to 1049 of SEQ ID NO:116, b is an integer of 15 to 1063, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:116, and where b is greater than or equal to $a + 14$.

FEATURES OF PROTEIN ENCODED BY GENE NO: 107

When tested against sensory neuron cell lines, supernatants removed from cells containing this gene activated the EGR1 assay. Thus, it is likely that this gene activates neuronal cells through a signal transduction pathway. Early growth response 1 (EGR1) is a promoter associated with certain genes that induces various tissues and cell types upon activation, leading the cells to undergo differentiation and proliferation. The gene encoding the disclosed cDNA is thought to reside on chromosome 1. Accordingly, polynucleotides related to this invention are useful as a marker in linkage analysis for chromosome 1.

This gene is expressed primarily in human gall bladder.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, relating to gastrointestinal disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the gastrointestinal system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., gall bladder, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:231 as residues: Pro-45 to Pro-51.

The tissue distribution in gall bladder indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of gastrointestinal disorders. Protein, as well as, antibodies directed against the protein may show utility as a tissue-specific marker and/or immunotherapy target for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:117 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of

a-b, where a is any integer between 1 to 1601 of SEQ ID NO:117, b is an integer of 15 to 1615, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:117, and where b is greater than or equal to a + 14.

5

FEATURES OF PROTEIN ENCODED BY GENE NO: 108

This gene is expressed primarily in human whole brain.

Therefore, polynucleotides and polypeptides of the invention are useful as
10 reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, neurodegenerative diseases. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of
15 the above tissues or cells, particularly of the central nervous and endocrine systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., brain, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard
20 gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:232 as residues: Gln-58 to Asp-64, His-69 to Pro-76, Leu-101 to Glu-108.

The tissue distribution in brain tissue indicates polynucleotides and polypeptides
25 corresponding to this gene are useful for the diagnosis and treatment of the central nervous system and endocrine system disorders. Furthermore, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the detection/treatment of neurodegenerative disease states and behavioural disorders such as Alzheimers Disease, Parkinsons Disease, Huntingtons Disease, Tourette Syndrome,
30 schizophrenia, mania, dementia, paranoia, obsessive compulsive disorder, panic disorder, learning disabilities, ALS, psychoses, autism, and altered behaviors, including disorders in feeding, sleep patterns, balance, and perception. In addition, the gene or gene product may also play a role in the treatment and/or detection of developmental disorders associated with the developing embryo, or sexually-linked
35 disorders. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:118 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome. Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1207 of SEQ ID NO:118, b is an integer of 15 to 1221, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:118, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 109

The translation product of this gene shares sequence homology with human translation initiation factor eIF3 p40 subunit.

This gene is expressed primarily in human adipose, human fetal spleen, and dendritic cells.

Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, adipose, immune and nerve cell disorders. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune and nervous systems, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., adipose, immune, nervous, cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID NO:233 as residues: Asn-27 to Ser-33, Gln-44 to Lys-50.

The tissue distribution fetal liver/spleen and dendritic cells indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and treatment of immune and nerve cell disorders. Furthermore, the tissue distribution in adipose tissue indicates polynucleotides and polypeptides corresponding

to this gene are useful for the treatment of obesity and other metabolic and endocrine conditions or disorders. Additionally, the protein product of this gene may show utility in ameliorating conditions which occur secondary to aberrant fatty-acid metabolism (e.g. aberrant myelin sheath development), either directly or indirectly. Also, the tissue distribution indicates polynucleotides and polypeptides corresponding to this gene are useful for the diagnosis and/or treatment of hematopoietic disorders. This gene product is primarily expressed in hematopoietic cells and tissues, suggesting that it plays a role in the survival, proliferation, and/or differentiation of hematopoietic lineages. This is particularly supported by the expression of this gene product in fetal liver, which is a primary site of definitive hematopoiesis. Expression of this gene product in primary dendritic cells also strongly indicates a role for this protein in immune function and immune surveillance. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:119 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1135 of SEQ ID NO:119, b is an integer of 15 to 1149, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:119, and where b is greater than or equal to a + 14.

FEATURES OF PROTEIN ENCODED BY GENE NO: 110

The translation product of this gene shares sequence homology with Ig V-chain, which is thought to be important in immune function. When tested against Jurkat cell lines, supernatants removed from cells containing this gene activated the NF-kB transcription factor. Thus, it is likely that this gene activates Jurkat cells by activating a transcriptional factor found within these cells. Nuclear factor kB is a transcription factor activated by a wide variety of agents, leading to cell activation, differentiation, or apoptosis. Reporter constructs utilizing the NF-kB promoter element are used to screen supernatants for such activity.

This gene is expressed in human synovial sarcoma, infant brain INIB cells, macrophages (GM-CSF treated), human endometrial stromal cells-treated with estradiol, human pancreas tumor, hemangiopericytoma, human endometrial tumor, chronic lymphocytic leukemia and a human colon carcinoma (HCC) cell line.

5 Therefore, polynucleotides and polypeptides of the invention are useful as reagents for differential identification of the tissue(s) or cell type(s) present in a biological sample and for diagnosis of diseases and conditions which include, but are not limited to, cancers such as human synovial sarcoma, human pancreas tumor, hemangiopericytoma, human endometrial tumor, chronic lymphocytic leukemia and
10 human colon carcinoma. Similarly, polypeptides and antibodies directed to these polypeptides are useful in providing immunological probes for differential identification of the tissue(s) or cell type(s). For a number of disorders of the above tissues or cells, particularly of the immune system, expression of this gene at significantly higher or lower levels may be routinely detected in certain tissues or cell types (e.g., immune,
15 cancerous and wounded tissues) or bodily fluids (e.g., serum, plasma, urine, synovial fluid and spinal fluid) or another tissue or cell sample taken from an individual having such a disorder, relative to the standard gene expression level, i.e., the expression level in healthy tissue or bodily fluid from an individual not having the disorder.

Preferred epitopes include those comprising a sequence shown in SEQ ID
20 NO:234 as residues: Leu-21 to Ala-30, Ser-38 to Asp-47, Pro-87 to Asp-94, Leu-197 to Thr-204, Pro-256 to Ser-262, Thr-277 to Arg-282, Thr-293 to Trp-303.

The tissue distribution in numerous cancerous tissues, and the homology to Ig V-chain, as well as the biological activity data, indicates polynucleotides and polypeptides corresponding to this gene are useful for the treatment and diagnosis of
25 cancers, including human synovial sarcoma, human pancreas tumor, hemangiopericytoma, human endometrial tumor, chronic lymphocytic leukemia and human colon carcinoma, as well as other tissues where expression has been demonstrated. Protein, as well as, antibodies directed against the protein may show utility as a tumor marker and/or immunotherapy targets for the above listed tissues.

30 Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are related to SEQ ID NO:120 and may have been publicly available prior to conception of the present invention. Preferably, such related polynucleotides are specifically excluded from the scope of the present invention. To list every related sequence is cumbersome.

35 Accordingly, preferably excluded from the present invention are one or more polynucleotides comprising a nucleotide sequence described by the general formula of a-b, where a is any integer between 1 to 1501 of SEQ ID NO:120, b is an integer of 15

to 1515, where both a and b correspond to the positions of nucleotide residues shown in SEQ ID NO:120, and where b is greater than or equal to a + 14.

Gene No.	cDNA Clone ID	ATCC Deposit Nr and Date	Vector	NT SEQ ID NO: X	Total NT Seq.	5' NT of Clone Seq.	3' NT of Clone Seq.	5' NT of 5' NT Start Codon	5' NT of First AA of Signal Pep	AA SEQ ID NO: Y	First AA of Sig Pep	Last AA of Sig Pep	First AA of Secreted Portion	Last AA of ORF
1	HFCCQ50	209463 11/14/97	Uni-ZAP XR	11	1271	1	1271	47	47	125	1	20	21	352
2	HTLAI54	209463 11/14/97	Uni-ZAP XR	12	1451	1	1451	125	125	126	1	22	23	157
3	HKABT24	209463 11/14/97	pCMVSPORT 2.0	13	2317	1	1809	66	66	127	1	22	23	553
4	HLWBF94	209463 11/14/97	pCMVSPORT 3.0	14	1472	1	1472	192	192	128	1	18	19	307
5	HFKFF78	209463 11/14/97	Uni-ZAP XR	15	1016	1	961	92	92	129	1	18	19	166
6	HSYBG37	209463 11/14/97	pCMVSPORT 3.0	16	1239	1	1239	48	48	130	1	24	25	305
7	HTHCA77	209463 11/14/97	Uni-ZAP XR	17	1405	1	1405	160	160	131	1	24	25	219

Gene No.	cDNA Clone ID	ATCC Deposit Nr and Date	Vector	NT SEQ ID NO: X	Total NT Seq.	5' NT of Clone Seq.	3' NT of Clone Seq.	5' NT of Start Codon	5' NT of AA of Signal Pep	AA SEQ ID NO: Y	First AA of Sig Pep	Last AA of Sig Pep	First AA of Secreted Portion	Last AA of ORF
8	HNHEZ51	209463 11/14/97	Uni-ZAP XR	18	1534	1	1534	106	106	132	1	32	33	98
9	HFIA X46	209463 11/14/97	pSportI	19	1233	1	1233	195	195	133	1	20	21	60
10	HFOXO72	209463 11/14/97	pSportI	20	1090	1	862	240	240	134	1	32	33	247
11	HODDW40	209463 11/14/97	Uni-ZAP XR	21	682	1	682	139	139	135	1	19	20	40
12	HSAWG42	209463 11/14/97	Uni-ZAP XR	22	770	1	770	31	31	136	1	27	28	74
13	HBMSK09	209463 11/14/97	Uni-ZAP XR	23	565	1	565	67	67	137	1	28	29	74
14	HDP AU16	209463 11/14/97	pCMV Sport 3.0	24	1356	1	1356	486	486	138	1	24	25	57
15	HFE BE12	209463 11/14/97	Uni-ZAP XR	25	617	3	617	99	99	139	1	22	23	173

Gene No.	cDNA Clone ID	ATCC Deposit Nr and Date	Vector	NT SEQ ID NO: X	Total NT Seq.	5' NT of Clone Seq.	3' NT of Clone Seq.	5' NT of Start Codon	5' NT of AA of Signal Pep	AA SEQ ID NO: Y	First AA of Sig Pep	Last AA of Sig Pep	First AA of Secreted Portion	Last AA of ORF
16	HFLNB64	209463 11/14/97	Uni-ZAP XR	26	648	1	648	62	62	140	1	39	40	45
16	HCESD11	209877 05/18/98	pBluescript	121	1025	1	1025	188	188	235	1	18	19	28
17	HSAWZ41	209463 11/14/97	Uni-ZAP XR	27	1388	1	1388	98	98	141	1	24	25	57
18	HNFJF07	209463 11/14/97	Uni-ZAP XR	28	616	1	616	86	86	142	1	21	22	66
19	HNGJO57	209463 11/14/97	Uni-ZAP XR	29	828	1	828	87	87	143	1	18	19	52
20	HE7TM22	209463 11/14/97	Uni-ZAP XR	30	581	1	581	70	70	144	1	22	23	65
21	HFRBR70	209463 11/14/97	Uni-ZAP XR	31	789	1	789	40	40	145	1	20	21	56
22	HTHBK35	209463 11/14/97	Uni-ZAP XR	32	884	1	884	108	108	146	1	26	27	66

Gene No.	cDNA Clone ID	ATCC Deposit Nr and Date	Vector	NT SEQ ID NO: X	Total NT Seq.	5' NT of Clone Seq.	3' NT of Clone Seq.	5' NT of Start Codon	5' NT of First AA of Signal Pep	AA SEQ ID NO: Y	First AA of Sig Pep	Last AA of Sig Pep	First AA of Secreted Portion	Last AA of ORF
23	HWABA81	209463 11/14/97	pCMVSPORT 3.0	33	866	1	866	57	57	147	1	21	22	48
24	HKGA73	209463 11/14/97	pSPORT1	34	1694	1	1694	38	38	148	1	27	28	88
25	HKIYP40	209463 11/14/97	pBluescript	35	1215	1	1215	43	43	149	1	32	33	76
26	HKMMW74	209463 11/14/97	pBluescript	36	1794	1	1794	202	202	150	1	21	22	41
27	HLFB127	209463 11/14/97	pBluescript SK-II	37	1174	1	1174	135	135	151	1	19	20	45
28	HLQCW84	209463 11/14/97	Lambda ZAP II	38	1087	1	1087	31	31	152	1	18	19	41
29	HBNAV22	209463 11/14/97	Uni-ZAP XR	39	438	1	438	13	13	153	1	40	41	43
30	HTEAM34	209463 11/14/97	Uni-ZAP XR	40	734	1	734	63	63	154	1	28	29	122

Gene No.	cDNA Clone ID	ATCC Deposit Nr and Date	Vector	NT SEQ ID NO: X	Total NT Seq.	5' NT of Clone Seq.	3' NT of Clone Seq.	5' NT of Start Codon	S' NT of First AA of Signal Pep	AA SEQ ID NO: Y	First AA of Sig Pep	Last AA of Sig Pep	First AA of Secreted Portion	Last AA of ORF
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32	H6BSG32	209463 11/14/97	Uni-ZAP XR	42	998	53	998	209	209	156	1	24	25	55
33	HCFAD33	209463 11/14/97	pSport1	43	658	1	658	297	297	157	1	17	18	44
34	HDTEN81	209463 11/14/97	pCMVSPORT 2.0	44	566	1	566	114	114	158	1	17	18	85
35	HFXDT43	209463 11/14/97	Lambda ZAP II	45	1277	1	1277	92	92	159	1	19	20	44
36	HNGHQ09	209463 11/14/97	Uni-ZAP XR	46	442	1	442	65	65	160	1	17	18	68
37	HHGDF16	209463 11/14/97	Lambda ZAP II	47	890	215	890	253	253	161	1	26	27	52
38	HJBCG12	209463 11/14/97	pBluescript SK-	48	737	40	737	382	382	162	1	24	25	56

Gene No.	cDNA Clone ID	ATCC Deposit Nr and Date	Vector	NT SEQ ID NO: X	Total NT Seq.	5' NT of Clone Seq.	3' NT of Clone Seq.	5' NT of AA of Signal Pep Codon	5' NT of First AA of Signal Pep	AA SEQ ID NO: Y	First AA of Sig Pep	Last AA of Sig Pep	First AA of Secreted Portion	Last AA of ORF
39	HOGAW62	209463 11/14/97	pCMVSPORT 2.0	49	571	1	571	259	259	163	1	26	27	55
40	HSWBJ74	209463 11/14/97	pCMVSPORT 3.0	50	356	1	356	43	43	164	1	35	36	47
41	HGBHR26	209511 12/03/97	Uni-ZAP XR	51	913	1	913	174	174	165	1	22	23	129
42	HKDBF34	209511 12/03/97	pCMVSPORT 1	52	1356	1	1356	18	18	166	1	19	20	104
43	H6EAB28	209511 12/03/97	Uni-ZAP XR	53	1547	1	1547	116	116	167	1	21	22	76
44	HLWAO22	209511 12/03/97	pCMVSPORT 3.0	54	1338	1	1311	212	212	168	1	21	22	354
45	HAGFH53	209511 12/03/97	Uni-ZAP XR	55	2071	1	2071	96	96	169	1	36	37	89
46	HHENQ22	209511 12/03/97	pCMVSPORT 3.0	56	1899	1	1899	115	115	170	1	36	37	58

Gene No.	cDNA Clone ID	ATCC Deposit Nr and Date	Vector	NT SEQ ID NO: X	Total NT Seq.	5' NT of Clone Seq.	3' NT of Clone Seq.	5' NT of Start Codon	5' NT of AA of Signal Pep	AA SEQ ID NO: Y	First AA of Sig Pep	Last AA of Sig Pep	First AA of Secreted Portion	Last AA of ORF
47	HKMLK53	209511 12/03/97	pBluescript	57	1543	1	1543	20	20	171	1	25	26	69
48	HSKGQ58	209511 12/03/97	pBluescript	58	1133	1	1133	41	41	172	1	37	38	78
49	HNFEQ93	209511 12/03/97	Uni-ZAP XR	59	1490	1	1480	33	33	173	1	33	34	173
50	HAIBZ39	209511 12/03/97	Uni-ZAP XR	60	1336	1	1336	48	48	174	1	17	18	63
51	HBXFP23	209511 12/03/97	ZAP Express	61	1705	178	1705	384	384	175	1	25	26	42
52	HEQBF32	209511 12/03/97	pCMVSPORT 3.0	62	1031	1	1031	97	97	176	1	25	26	113
53	HETHE81	209511 12/03/97	Uni-ZAP XR	63	1589	1	1589	182	182	177	1	23	24	155
54	HFPAC12	209511 12/03/97	Uni-ZAP XR	64	1088	1	1088	140	140	178	1	21	22	88

20. A method for identifying a binding partner to the polypeptide of claim 11 comprising:

- (a) contacting the polypeptide of claim 11 with a binding partner; and
- (b) determining whether the binding partner effects an activity of the polypeptide.

21. The gene corresponding to the cDNA sequence of SEQ ID NO:Y.

22. A method of identifying an activity in a biological assay, wherein the method comprises:

- (a) expressing SEQ ID NO:X in a cell;
- (b) isolating the supernatant;
- (c) detecting an activity in a biological assay; and
- (d) identifying the protein in the supernatant having the activity.

23. The product produced by the method of claim 20.

<110> Human Genome Sciences, Inc. et al

<120> 110 Human Secreted Proteins

<130> PZ021PCT

<140> PCT/US98/27059

<141> 1998-12-17

<150> 60/068,008

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<210> 15

<211> 1016

<212> DNA

SUBSTITUTE SHEET (RULE 26)

<213> Homo sapiens

<400> 15

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ggccccctacg gtgagcggga cgaccagcaa gtgttcatcc agaagggtgg gcccagtgcc      180
agccagctct tcgtgcgtct ctcatctact gggcagcggg tgtgctccgt gcgctccgtg      240
gacggctcac ccacgacagc cttcacagtg ctggagtgcg agggctcccc ggcggctcgg      300
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cctaaccacc gccatggacg gcctcggcca ggccccctgca ggtggcctga cggagcaaga      420
gctgatggaa cagctggaac actgtgagct ggcccccgcc gctcctttca gtcctctcat      480
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tccgacggcc acccacacca gcccgtggc cctccagcgg tctcggcact cccctcacac      720
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caggccaagg cctccttgga ataatggtt attgttacta ggtccccacc ttccctcttt      900
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<210> 16

<211> 1239

<212> DNA

<213> Homo sapiens

<400> 16

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cgaagatgaa ggtggtggag gagcccaacg cgtttggggg gaacaaccgg ttcttgcttc      180
aggccagtcg cctccaggcc aagagggatc cttcacccgt gtctggaccc gtgcatctct      240
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gcaaccggct ggcccattgt tccgagccga gcacctgcgt ctacgcgctg acgttcgaga      540
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agcggcagtg ggaccaggta gagcaggacc tggccgatga gctgatcacc cccaggggcc      660
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atgaacccac ccagctggag ggaggtcctg acagcttggg gtttgagacc ctggaaaact      780
gcaggaaggc tcataaagaa ctctcaaagg agatcaaaag gctgaaaggt ttgctcacc      840
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agattcsagg ttttaattaa ttccataact gataaaaaata actccatgaa ttctgtaaac      1140
cattgcataa atgctatagt gtaaaaaaat ttaacaaggt gttaacttta aacagttcgc      1200
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<210> 17

<211> 1405

<212> DNA

<213> Homo sapiens

<220>

SUBSTITUTE SHEET (RULE 26)

<221> SITE
 <222> (1403)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (1404)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (1405)
 <223> n equals a,t,g, or c

<400> 17

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atcaccttct	tcttcagagc	ctcagtttgc	ctgtcgggtca	tgccctgcct	ggaggccgtg	180
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ggggaggggg	ccgtgggagg	cttcaggagc	agctgggtgtg	aggacgtcag	atacctgggg	300
aaaaactgga	gtttcgtgtg	gtcgayyctc	rgagtgaccg	ccatggcctt	tgtgactgga	360
gccctggggg	tctgggcccc	caagtttctg	ctcgaggcac	gcgtgggttca	cgggctgcag	420
cctccctgct	tccaggagcc	gtgcagcaac	cccagacagcc	tgatttttgg	ggcactgacc	480
atcatgaccg	gcgtcattgg	ggtcatcttg	ggggcagaag	ctgcgaggag	gtacaagaaa	540
gtcattccag	gagctgagcc	cctcatctgc	gcctccagcc	tgcttgccac	agccccctgc	600
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cttggggarc	tgcttctgtc	ctgcaactgg	gcagtgggtg	ccgacatcct	gctgtctgtg	720
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ccgggcctgg	cagmctgtca	cagggacccc	agacagcaat	gatgtggaca	gcaatgacct	1020
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cctgcactcg	tcttgctgc	aagcctcccg	ttggtcccca	cagcagcagt	gcctcggttc	1140
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taaaaaaaaa	aaaaaaaaaa	aannnn				1405

<210> 18
 <211> 1534
 <212> DNA
 <213> Homo sapiens

<400> 18

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ccactgcacc	tggtaggcat	caaattttga	atagagaagt	taaccatgat	gaatcaacac	120
ttgcttgaat	cgtttggttc	tccctcctcc	ttggtcattg	tctttattct	gtcatcttgg	180
atgttgcaaa	gatgtaaaga	ttttttcctt	tggtgtctata	gagtagtgct	aactccatca	240
ttctggcaga	agcaccaaca	cccagatccc	aaaattaagc	atcatttgaa	gctataactca	300
ctgaaataca	gttcttctgg	gcagaacaac	ttcagaaagg	acaaacattg	gctttctggc	360
cacacggaag	aggcaaattt	aataaaggaa	gaatggaagt	aatgttcaat	atcaccagga	420
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tgagcacgtg	gaaagagtga	tcttaagtcc	tccactgata	ctaataat	ctgttgatt	540
cgcggtgtacc	cttaattatc	catttaaaaa	gctaattatt	gctgttagtg	gtggtggtgg	600

SUBSTITUTE SHEET (RULE 26)

ttgcatgtat	atacgtgttt	caaaaccatc	tgacacagcc	tattcaatgc	tttcctctag	660
ttcatacctc	tgtactgggt	tcctgtgtct	gccacagaaa	ttgccaccaa	ggtagcttaa	720
agtaatggaa	atctgctctc	tcacttttct	ggaggctaca	aatctgcaat	caagggtgtca	780
acaggccatg	ctccctctga	aggctctgcg	gaagaatcct	ttcttgcttc	ttcctagttt	840
tgatgggtgc	tgccaatcct	tggcattccc	tggcttggtg	ctgcaacact	ccaatctctg	900
cctcaatcat	cacatgacct	tccttggtga	tctcctttgt	gtctctgtgt	tcaaataatt	960
cttccttttc	tcctgtacat	ataccagtca	ttggatttag	ggttctcttg	atccagtatg	1020
atcttatctc	aactggatta	tatcttcaaa	gaccttattt	gaacgcctta	tttccataac	1080
ggtcacattt	ccaagtacaa	gggttaggac	ttaaaacata	ccttcttggg	ggccacaatt	1140
taacctatta	tatcccacta	cacagtatat	gccatgacag	aacctctttc	atgagaccaa	1200
catgaaatgt	agagtgatat	gattctttat	gtgatcaatg	agtatttgca	gacaatgctg	1260
atgattcccc	tgagaatatc	atggctccct	cccttactta	tttagatata	tgttcaggct	1320
gggtgctgtg	gctcatgcct	ataatcccag	cactttggga	ggggagggaag	gtggttcact	1380
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<210> 19
 <211> 1233
 <212> DNA
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (491)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (493)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (497)
 <223> n equals a,t,g, or c

<400> 19						
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tgtatcatct	gattcagaaa	tctacgctgg	gcttggtagt	ttggtttcgg	gaacatctgg	180
attccaggtc	tcaaatagaca	tcacgctat	tcatTTTTct	ctttctctgg	ttctgccctc	240
caccacgtat	cagctttggt	ctgtgttggc	ctcagcccca	ttctcaagtt	cacattcagc	300
atgaaaaggc	tgatcacctc	ttccagtcac	tcaagcaaaa	agccccagg	ttgctgcaat	360
gggctagaat	agtttgactg	taatcacatg	accacctcta	agccaatctc	tgtgggccag	420
gcaccccagt	ggttggttta	rgcctggatc	ttgtgacaca	ctcctgaaca	catgactcga	480
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tcacctgtgt	ccactgtggt	tgtatcaarg	gcgtgtgggt	tgtgctgtgc	tgggcgtaca	600
ctagtgtgtg	cattggccag	ctcggkktgc	cacgttattg	gctttgggat	gctggttccc	660
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gtttccgtcg	ccagagactg	aaatagtgtg	ttccctgagg	accctgaag	aagcttggtc	900
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ataatagctg	ttgagttcac	ggagttagta	caattratgca	tccccactga	ggctcaagag	1020
gtgaagtcac	atagccagtt	agtggtagag	atggggcctg	aacctgggtc	ttcctgactc	1080

SUBSTITUTE SHEET (RULE 26)

10

actcagctac	ctttccatag	aaatagggac	tggaggccgg	gcgcagtgcc	tcatgccttt	1140
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aaaaaattaa	aaaaaaaaaa	aaaaagggcg	gcc			1233

<210> 20
 <211> 1090
 <212> DNA
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (4)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (17)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (47)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (1033)
 <223> n equals a,t,g, or c

<400> 20	
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gacatgatac	
gccaaagntta	
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atagggaaag	120
ctgtacgctg	
cagtaccgtc	
cggaattccc	
gggtcgaccc	
acgcgtccgc	
gcggctcatg	180
cccccagtat	
cccgggtccag	
ctattccgag	
gacatcgtgg	
gctctcggag	
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agcagatggt	
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tggctgttcc	300
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ggagtgaatt	
ggacgtgggc	360
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ccttttagtcg	
ctctgggtcg	
cgagggcggc	
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cgcgaactac	420
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cctcctggtc	
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gctaccatcg	
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cggcagtcag	
cggaagacta	
cgagaaggaa	
gagagccatc	
ggcagaggag	540
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gggagcgcct	
gaagtgtggg	
ggccgtctcc	600
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ctgacgaaca	
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agcagcagtt	
cagattccaa	
ctcggaagaa	
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agaagaccag	720
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aacaagaaaa	
aaagaaagaa	
taagtcgtct	
aaaagaaagc	
ataggaaata	780
ttctgatagt	
gacagtaact	
cagagtcgtga	
cacaaattct	
gactctgatg	
atgataaaaa	840
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aaaagaagaa	
aaagaaacac	
aaaacaaara	
aaaagaagaa	900
taagaaaacc	
aaaaaagaat	
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aagctgtaaa	
gactcagaag	
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atagggccag	1020
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taatacatac	
ctcttcaaga	
tgaaaaacct	
ttgaagtatg	
ggccatgctt	1080
tgnttcccgg	
tggaagggtgc	
agctatggct	
gagtatgtta	
aaagctggga	
agcgattccc	1090

<210> 21
 <211> 682
 <212> DNA
 <213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

<220>
 <221> SITE
 <222> (624)
 <223> n equals a,t,g, or c

<400> 21
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 ggctaataaaa taataatttg caatatatag attgtatttt gtctttgaaa cgctgtgagg 120
 agatcctctt aatgtggcat ggtctgcttc tatgccttgc ttctgtgttt cttgagctcc 180
 gtggagatag gccccctctc ctggcttctc tgcttgagcc acataaaaatg ccacttcaca 240
 gctcttcctt ttgaagcctg atccagtatg catttgagagc taattactgc agttgacaca 300
 actccatcta aaagcgtcat gaaagattct gtaatcactg ataagaaaat gatcttgcaa 360
 attattgctg tgtcctcctt tattgcctct ttaccttaac agtacagttt acaataatgt 420
 aaattttttt ctaatctttc aactttaacc ctagaaattg tagatgttt agcagtgggt 480
 atgtgatatt ggcacaacat aactatataa tttgctcaat attgtgggtgc atacctgtaa 540
 tcccagctgc tcaggagtct gaggcattgag aatcacatga acccaggaga tggagggtgc 600
 ggtgagctga gagcgagtca ctgnactcca gccaggacga cagagtga aa ccctgtctca 660
 aaaaaaaaaa aaaaaactcg ag 682

<210> 22
 <211> 770
 <212> DNA
 <213> Homo sapiens

<400> 22
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 ggrctccttt tcctgctgat ctttctaggt cttgactctc tgccctcggtg cttgaccgct 120
 acccggcttc agagtccaat aattatattt tcaactttgt cctgtatatg ctccacttct 180
 tggctggaac tctgttcagt ttatttcctg actttgaact atctccacgt agtgccacct 240
 tgtttcctga tctaaggact gtgcaactcc tctccagtcg gccacatctc tgaccaaggg 300
 attcagtga aactctgggt tctcacctga actttgatct ttaacccag ctgacactag 360
 taatggcctt tgtgatcagg ctctgaaaga agactgactt catgtgaacc atgtgagcat 420
 attgttcata tatccctcaa ggtggatcct tcttttctaa aaggcatcta aaaagcaacg 480
 gaagttcttt tgaaaatcag aggctgcctt tttggtagca gttctttcat ttattctgta 540
 gaggatccag attgagctct ttataaaata ttctcctaca taatgtactg ggatagtctt 600
 aacaatagta aaccttgatc cacagatcac atgtgccatt ggataaaaat aaataatgca 660
 ragraactca ataagaccag cctgttttaa ggagacatca taaaaacctc cattaaaaaa 720
 aaaaaaaaaa aactcgaggg ggggcccgtg cccaatcgcc tgtgatgatc 770

<210> 23
 <211> 565
 <212> DNA
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (10)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (21)
 <223> n equals a,t,g, or c

<220>

<221> SITE

<222> (538)

<223> n equals a,t,g, or c

<400> 23

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attgtgggga	tgtttacatg	gttggatgca	tttgtcaaaa	cacacttaat	ggtaatgcaa	180
aatgaatata	ttttatttta	tgtaaattat	acctcaaagt	tgaatttttt	taaaaagttt	240
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tgtttcttta	gatttgactt	tccaagtttg	aaaagaccag	tttaaaaaatg	acttttgctg	360
ggcatggtgg	catgtgcacg	tagtcttacc	tactcaggag	gctgacgcag	gaggggtccct	420
tgagcccagg	agttggaggc	tacagtgcag	tatgattatg	ccactgcact	ccagcttggg	480
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cggtagcccaa	ttcgcccaaa	atgga				565

<210> 24

<211> 1356

<212> DNA

<213> Homo sapiens

<400> 24

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ccctgcttat	tcctgtgaat	caagtagtga	tctcctgcag	cttggaagaa	aaaataaggg	120
atgggtaatg	taaaaatctg	gatcaatata	ctgggtctgg	gcaattatcc	tgcaaattct	180
gccaggtaat	aaaagtgcgt	aggggtgcca	taatccggaa	gtttctttgt	ttaggaaaat	240
aaaaacaagg	aacttcatag	accccccaa	aggggaattc	tatatcttga	caagtaaaat	300
tttagatgga	aattatctac	aacaccacac	ttacggaaat	tgctatcctc	actctattat	360
ttgcaaaagg	gttatacaca	gtagcacctt	ctaactgaag	tattaaacag	agtttccatt	420
gctgtcgtat	tttgcttaat	tattatcctt	atagcaggga	taatagttac	taacaaaaag	480
gaagcatgaa	agttttacta	tcactgagcc	tggtaggact	ttttattggg	tttagtgatg	540
cagtttttaa	tgaaacatgc	cgcttttgga	ttaatacctc	tagtaaagga	aatttacaga	600
tacttaaaaa	tcaaatacaa	attattgata	ggctcaggaa	aatgccagct	tcagcctgag	660
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<210> 25

<211> 617

<212> DNA

<213> Homo sapiens

<400> 25

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<210> 26

<211> 648

<212> DNA

<213> Homo sapiens

<400> 26

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gccaccttct	ttaagctcag	tttatttttg	acttactttc	tttgctgtag	ttatgaacct	540
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<210> 27

<211> 1388

<212> DNA

<213> Homo sapiens

<400> 27

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 <212> DNA
 <213> Homo sapiens

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 <222> (17)
 <223> n equals a,t,g, or c

<220>
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 <222> (580)
 <223> n equals a,t,g, or c

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 aaaaaaaaaa ctcgag 616

<210> 29
 <211> 828
 <212> DNA
 <213> Homo sapiens

<400> 29
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<210> 30
 <211> 581

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<212> DNA

<213> Homo sapiens

<400> 30

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<210> 31

<211> 789

<212> DNA

<213> Homo sapiens

<400> 31

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tctcagcct						789

<210> 32

<211> 884

<212> DNA

<213> Homo sapiens

<400> 32

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 <212> DNA
 <213> Homo sapiens

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 <211> 1694
 <212> DNA
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<211> 1215

<212> DNA

<213> Homo sapiens

<400> 35

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<210> 36

<211> 1794

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (1675)

<223> n equals a,t,g, or c

<400> 36

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gaatatcttg	agcctgggag	ccagagggtg	cagtgagccg	agatcattcc	actgcattcc	1740
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<210> 37

<211> 1174

<212> DNA

<213> Homo sapiens

<400> 37

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tgagccctgc	cacacagttg	aacattgggt	agagcccatg	ggccaggggc	agaggcagga	300
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ccattcctgt	tgccaaagagc	cttgggggta	ggggaagtag	acaggaattc	accactcctt	420
aaaaccagag	aagtcagag	tcctctgagg	gacagggtc	ttgatgttca	gagggaatca	480
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<210> 38

<211> 1087

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (408)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (1005)
 <223> n equals a,t,g, or c

<400> 38
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 tccttaaatt ggctcggag acctgtgatg gccaatcttc cccacccctg tgggtcaggt 240
 tcctctgggtg tgggcctatc tcttagtgca aggtccctg tagactgtcc tggggctgcc 300
 tgtctaattg tcttctcatg aaccaggtag gcargcagga accactcatc tagtctgggg 360
 gtgactgggg ggtgcgaaaag ttttggtaca ggatgtattt aacacttnca ttgtctggct 420
 caaaattctc ttggaagaaa ctgcctttgt ttaattctgt ttawttattt agaacttacc 480
 tagaattgat ttgcacttgc aaaaatgctg ctgttttaga gtttgctttc taggctgggt 540
 gcttgctctg tcaccttagc taaaaactag gtactggagt gccttttcta ttcycttctc 600
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 tgaacctggg agggagttgc ggtgagcgga gatcgggcca ttgcactcca gcccgggcaa 780
 cagatcctga ctcttatcaa aaaaaaaaaa aaaagaaaat taaccttagt ttaactttct 840
 tgccttacca agtttttaag ttttaaaatt ttttactctt ttgtaatagc acttagttta 900
 aaacacaaca cattgtacag ctgtactaaa tatacttca tttatatcat tgttccatag 960
 cttttttctt ttgtgtgtgt gtgtgtgtgt gtatgtgtgg gtgancagtg agatccgtct 1020
 caaaaaaaaa ccaaccaaac aaaaaaaaaa aaaaaaactc gtaggggggg atccggtacc 1080
 caattcg 1087

<210> 39
 <211> 438
 <212> DNA
 <213> Homo sapiens

<400> 39
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 gcatctctgg cctctacctc ctaaatgccca gtgcaccctc cctgcagtta aatgacccca 180
 aatgtctcca gacataggca aatgttcccc ggagaacaaa gtcacttttg gttgaggaac 240
 aaaatgaacc tatatttaag atggtctaaa tgtttctgag atggtctaaa catttataag 300
 cttaacaatt aacttgaaac tcttcaggac tagagaagct atttgtaaat ttaaacatct 360
 gacgccttga aacaccttta tcataaagat aactaaacca gtgttctttg tgaatggcca 420
 aaaaaaaaaa aaaaaaaaaa 438

<210> 40
 <211> 734
 <212> DNA
 <213> Homo sapiens

<400> 40
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 ccatgcctcc cctggccccc cagctctgca gggcagtgtt cctggttcct atcttgctgc 120
 tgctgcaggt gaagcctctg aacgggagcc caggcccca agatgggagc cagacagaga 180
 aaacgccctc tgcagaccag aatcaagaac agttcgaaga gcactttgtg gcctcctcag 240
 tgggtgagat gtggcaggtg gtggacatgg cccagcagga agaagaccag tcgtccaaga 300

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20

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<210> 41

<211> 1346

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (707)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (998)

<223> n equals a,t,g, or c

<400> 41

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ttaaggatga	tgagggggaa	atggaaaagag	tctgaagg	accagtgtca	gagacagata	540
gaaaagggct	gcctgagccg	ggcgagtg	ctcacgctg	taatcccaac	actttgggag	600
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<210> 42

<211> 998

<212> DNA

<213> Homo sapiens

<400> 42

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21

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gccttctccc	tcgtttgtaa	cattgagatc	ctagtagcag	ttacttctta	gggttggttag	480
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caccttcctc	tctcacctct	tggcacttcc	ctcaaaaaag	agagaagtgg	agcacagtaa	660
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<210> 43
 <211> 658
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> SITE
 <222> (6)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (15)
 <223> n equals a,t,g, or c

<400> 43	
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aagccttgat	attgatactg
actgttttca	gtattttacc
tcaatggtag	aatgtattag
tgaagatggg	gcttggcctg
gacatcatag	caagaactat
agctaagtgt	atgaggggga
tctcatagta	cttttttttc
attgagccac	acctcttctt
acatttattt	cagaacaata
taccggaatt	acccgggtac
ctttgatttt	gcaagggata
gttagctctt	ctgcttggga
gcaatcaaag	tatcgtgtta
aacagtccat	gctgatctta
tgaatttggt	gagtggcaaa
tgcaaaccct	tcaattccca
acgggtgcat	tttcattcat
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tttgtgacaa	aaaaaaaaaa
	aaaaaaa

<210> 44
 <211> 566
 <212> DNA
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (68)
 <223> n equals a,t,g, or c

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<400> 44

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aagtctcct	cctgatcaca	gccatcttgg	cagtggctgt	tggtttcca	gtctctcaag	180
accaggaacg	agaaaaaaga	agtatcagtg	acagcgatga	attagcttca	gggttttttg	240
tgttccctta	cccataatcca	tttcgcccac	ttccaccaat	tccatttcca	agatttccat	300
ggtttagacg	taatttttct	attccaatac	ctgaatctgc	ccctacaact	ccccttcccta	360
gcgaaaagta	aacaagaagg	aaaagtcacg	ataaacctgg	tcacctgaaa	ttgaaattga	420
gccacttcct	tgaagaatca	aaattcctgt	taataaaaga	aaaacaaatg	taattgaaat	480
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aaaaaaaaaa	aaaaaagggs	ggcgcg				566

<210> 45

<211> 1277

<212> DNA

<213> Homo sapiens

<400> 45

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acatgtaaca	ggggagcaga	aggagggata	aatgatttgt	ttatgctcaa	taaagatggt	120
gctgctgttc	tgtcagctaa	cctttgctct	cataacctgc	ataaacttgc	aaagtcttta	180
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cccatagtgg	gttatgtctc	ccaaatctgg	ctttctaacg	ataatggaat	ctggcctaac	420
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ttcagatatt	taacacaact	ttcaggcctt	cttttgcat	cttttcaggc	cacaggacac	960
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tttctgtca	cttgaggtaa	aaccttaagt	caacttgaag	attacagaat	tgaattgtct	1200
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ttatcgatac	cgtcgac					1277

<210> 46

<211> 442

<212> DNA

<213> Homo sapiens

<400> 46

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gtggctgagt	ggaggcccat	ccttaggtac	ctccagtgag	cagcctacat	ccttggagga	180
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tagtgtgagg	tcagagtctg	tctagcagca	taaaaacaac	caaaagattt	tctgagcctc	360
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442

<210> 47
 <211> 890
 <212> DNA
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (818)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (819)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (829)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (859)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (887)
 <223> n equals a,t,g, or c

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tgagctacaa	
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tcaggaacaa	
gtaatgtatt	
agtatgggtc	
aagattggtg	120
ataggaactg	
tctcaaaagg	
atgggtgggtta	
ttttaaatat	
aaatagctaa	
tgggggtggt	180
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aattaaatgc	
cttgtataaa	
atccaaaatg	
aatgcaaaat	
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tactgtttta	
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gtagatgcta	
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aacaatgaag	720
aattatgtaa	
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aaatgtaagc	
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aaataaaaatg	
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tgaaaaaaaa	
aaaaaaaaaa	
actcgagggg	
gggcccgnna	
cccaatcgnc	
caaaagttag	840
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attcactgng	
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caacgtcgtg	
actgggnaaa	890

<210> 48
 <211> 737
 <212> DNA
 <213> Homo sapiens

<220>

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<221> SITE
 <222> (736)
 <223> n equals a,t,g, or c

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 tctgatttga agagaataaaa tggattttgc acaaaaccac aggaaagtcc cggagctcca 240
 tcccgcaactt acaacagagt gcctttacac aaacctacgg attggcagaa aaagatcctc 300
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 cttgatgctg caaagaacaa gatgcgagtg aagatcagct atctaataatg tgccctgacg 420
 gtggttaggat gcatcttcat ggttattgag ggcaagaagg ctgccccaaag acacgagact 480
 ttaacaagct tgaacttaga aaagaaagct cgtctgaaag aggaagcagc tatgaaggcc 540
 aaaacagagt agcagaggtg tccgtgttg ctggattttg aaaatccagg aattatgtta 600
 taacgtgcct gtattaaaaa ggatgtggta tgaggatcca ttccataaag tatgatttgc 660
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 aaaaaaaaaa aaaaanc 737

<210> 49
 <211> 571
 <212> DNA
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (249)
 <223> n equals a,t,g, or c

<220>
 <221> SITE
 <222> (548)
 <223> n equals a,t,g, or c

<400> 49
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 ccggctagag gaagaggcgt tgcggcgaaa ggaacggctg aaggccctac gggagaaaac 120
 cgggcgcaag gtgagaagtg tggagtgagg gtcgcagttg aggcgtccag cgttcggggg 180
 ccgggtcgcg cttgaggaga gcaaagggtc aataaggaaa gacagctgcc gagggcgcg 240
 atgcgggnc gctaaccgat gcgcgagaag acgggcgccc tcccacgatg tctggggctg 300
 cttggcggtg gactcctctg gcgctggtgc ggtcgctcgc cacgcgcggg ggtgggcaar 360
 gcatggtcag cgacccgcag tccatctgac tcctgcttcc cgggtgttgc tcgtgtaggt 420
 atctagggct gcctgtaggt tcagatgctt gttgggttag gcgtgatttg ttccgttctc 480
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 tcgggcangc aattcccttg gaacaagggc a 571

<210> 50
 <211> 356
 <212> DNA
 <213> Homo sapiens

<400> 50
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 tccctccctc cctctctact ctccctccct ccttcaggcc tcttagcatt gtttgttttc 120
 ccatttctga tactactact ccatgctgaa gatttgccat attactattt tggaaacatt 180

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25

gagtgataga	actcctagaa	aatttgcaaa	gaaatgttac	atactgtata	tcaaactctc	240
agattctagt	gttgaaaaag	tagcctatac	tttgctatta	cttatacctg	ctgccataga	300
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<210> 51

<211> 913

<212> DNA

<213> Homo sapiens

<400> 51

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ttgctcttgt	cagctttggg	agggcagact	ccatagtggg	agatgggctt	ccaaccaacc	420
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aaaaaaaaaa	aaa					913

<210> 52

<211> 1356

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (1231)

<223> n equals a,t,g, or c

<400> 52

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tgggagataa	agcatatgcc	tgggatacca	atgaagaata	cctcttcaaa	gcgatggtag	180
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ccttctctgt	gttgagggtgc	aatcagccat	aagaatgaac	aagaaccgga	tcaacaatgc	360
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26

taaattttcc	agtggaggat	acataataa	tgggtgtagaa	atcattgaaa	atggatcctt	1080
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<210> 53

<211> 1547

<212> DNA

<213> Homo sapiens

<400> 53

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<210> 54

<211> 1338

<212> DNA

<213> Homo sapiens

<400> 54

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aagtttgacg	tggccctgct	agatgactca	gtccgtgtgt	ataatgccag	cagcaccata	180
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acctccttgt	ctaccggacc	ctcttctggc	tgtgcccagg	tgctgtctca	ccctgggcat	360
acacctgtta	ccagcttggc	ctggggcccc	agtggggggc	ggctgctctc	agcttcaccg	420
tggatgctgc	tatccgggta	tgggatgtct	caacagagac	ctgtgtcccc	cttcctgggt	480
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cactgtattg	ggagagccac	tgatttactc	cctgtctttt	ccagaacgtt	gtggtgaggg	720
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aaaaaaaaaa	aaaaaaaaaa					1338

<210> 55

<211> 2071

<212> DNA

<213> Homo sapiens

<400> 55

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<210> 56
 <211> 1899
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> SITE
 <222> (1439)
 <223> n equals a,t,g, or c

<400> 56
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<210> 57
 <211> 1543
 <212> DNA
 <213> Homo sapiens

<400> 57
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29

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<210> 58

<211> 1133

<212> DNA

<213> Homo sapiens

<400> 58

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<210> 59

<211> 1490

<212> DNA

<213> Homo sapiens

<400> 59

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30

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<210> 60

<211> 1336

<212> DNA

<213> Homo sapiens

<400> 60

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<210> 61
 <211> 1705
 <212> DNA
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (779)
 <223> n equals a,t,g, or c

<400> 61
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 ctgtacagat gcaacctttg atgatacata tatttgataa aaatgagaaa acagattttgt 240
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<210> 62
 <211> 1031
 <212> DNA
 <213> Homo sapiens

<400> 62
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 gtgcctctgc gttatgtcgt ttggttgatg catttgaga gaatctgtgc tctccacaac 180
 tgcaggggca acatgctttc ctggcctctt cagatcaggg tggctgttct tgggtgctgc 240
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 ccagggtccgt gttctcacag tgctgccatc ttctctcgt gtgagcgtgg gctgtgcgga 360
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<210> 63

<211> 1589

<212> DNA

<213> Homo sapiens

<400> 63

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gcaaaaaaaaa	aaaaaaaaaaa	aaaaaaaaaaa				1589

<210> 64

<211> 1088

<212> DNA

<213> Homo sapiens

<400> 64

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<210> 65

<211> 1256

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (1079)

<223> n equals a,t,g, or c

<400> 65

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<210> 66

<211> 1602

<212> DNA

<213> Homo sapiens

<400> 66

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<210> 67

<211> 938

<212> DNA

<213> Homo sapiens

<400> 67

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aaatataata	aaaataaaaa	tctagttaa	tactgcatta	tttattttcc	taaggctaaa	720
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<210> 68

<211> 1585

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (904)

<223> n equals a,t,g, or c

<400> 68

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ttagtcattc	caccagtgc	tgataggaaa	tgaggctttt	cttcccctga	ccaaaactcc	360
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<210> 69

<211> 1676

<212> DNA

<213> Homo sapiens

<400> 69

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attgtccmac	tgataatact	ttttgcaaac	agaaactgtt	aaaaccttta	aagcaaatat	360
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36

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<210> 70

<211> 1344

<212> DNA

<213> Homo sapiens

<400> 70

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aaaaaaaaaa	aaaaaaaaaa	aaaa				1344

<210> 71

<211> 1474

<212> DNA

<213> Homo sapiens

<400> 71

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taatatattg	ttgatcttca	catattttat	atgcatatat	atatcaagaa	gttatatata	120
tataactcaa	gaaactcaag	ttatatatat	atgtcaagaa	atgtatgatt	attttggaga	180
gaatgggccc	aaatgtgaaa	aagatatata	aaaaacaaaa	aaaacaaaaa	aaaaacacta	240
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<210> 72

<211> 2012

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (1468)

<223> n equals a,t,g, or c

<400> 72

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<210> 73

<211> 1267

<212> DNA

<213> Homo sapiens

<400> 73

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<210> 74

<211> 1748

<212> DNA

<213> Homo sapiens

<400> 74

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<210> 75

<211> 1570

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (7)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (8)

<223> n equals a,t,g, or c

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<222> (10)

<223> n equals a,t,g, or c

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40

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<210> 76

<211> 524

<212> DNA

<213> Homo sapiens

<400> 76

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<210> 77

<211> 1306

<212> DNA

<213> Homo sapiens

<400> 77

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41

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<210> 78

<211> 1479

<212> DNA

<213> Homo sapiens

<400> 78

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<210> 79

<211> 1794

<212> DNA

<213> Homo sapiens

<400> 79

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<210> 80

<211> 1280

<212> DNA

<213> Homo sapiens

<400> 80

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<210> 81

<211> 974

<212> DNA

<213> Homo sapiens

<400> 81

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43

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<210> 82

<211> 1955

<212> DNA

<213> Homo sapiens

<400> 82

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aatgagtggg	gctataaatg	taaaatacac	tggattttta	agacatggta	gaaaaagaac	1860
agaaaatatt	ttttgtattg	attacatgtt	gaaacaatat	tttggctata	atgggttaaa	1920
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<210> 83
 <211> 638
 <212> DNA
 <213> Homo sapiens

<400> 83
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 gagaaactgt tatatctttt taatgattta ttgcaagta ttgagatttg acctgaaaaa 240
 caatgaaaca catgaacaca cttccgattt tctcctcgct gattagcttc ctgcctgctg 300
 tcagtgtctg acgaagtgtg ataactactt tatgtaacat tacagaacag cttagaggtcc 360
 tggggtaaga gaaaaaaaagc acatcacaaac aaatgtgaaa gccttcatta ttacacgttc 420
 cagtttgtct cgctgtgtag gcataagcta atgggtttatt ttcagaaaagc tgcctgaaac 480
 gttgctttgt attcttctag gaagaacttt aattcctcct gaggaactct actttctgag 540
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 actttctcgt aaaagttaaa aaaaaaaaaa aaaaaaaa 638

<210> 84
 <211> 859
 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (27)
 <223> n equals a,t,g, or c

<400> 84
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 aaaaaaaaaa aaaaaaaaaa 859

<210> 85
 <211> 1129
 <212> DNA
 <213> Homo sapiens

<400> 85
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45

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aagtaagcag	caagaaagat	atgggtgaag	agtctgaggc	gggaagggga	actgagacct	360
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cagagtgata	aactaagtca	catacagata	aagcactgaa	aacaccacag	tgaccctccc	480
acccccacc	aatatgtaat	tctattaata	gaaacagctg	tgtaaagaag	tctaaaattt	540
tcactatttc	caatgataaa	ctcttcagtg	ctcttcttga	aatgtcacat	tatttcccaa	600
caagttatac	ctatttttag	tattcttggt	gctagtgcca	tgacaaactt	caatagctag	660
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<210> 86

<211> 2674

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (2607)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (2611)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (2621)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (2634)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (2650)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (2660)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (2669)

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<223> n equals a,t,g, or c

<400> 86

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cagaggaaaa	gggtggactc	ctatgtgacc	tgttcttaga	gcaagacaat	caccatctga	180
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acatcaagtc	aattttcaaga	catactttcc	ggggactaaa	gkcathtaatt	cacttgagcc	660
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<210> 87

<211> 1636

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

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<222> (1624)

<223> n equals a,t,g, or c

<400> 87

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ctggtgacag	ccaccaggaa	cctcaggatg	gaccagtcag	cttcaaacct	ggccaccttg	540
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cggnggcaag	ctggac					1636

<210> 88

<211> 1639

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (12)

<223> n equals a,t,g, or c

<400> 88

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gtggagcctg	ggcttcacag	tgacactcac	gtttgaactc	ccggtcggct	gtgtgcttgg	240
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cccctgcagg	accgagatga	tgtccaatga	caagccctgg	cttccagcca	atgctcctgc	360
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gactggaatg	atctggcttg	gcctgttccc	ccaccagact	tattttcagg	cgccccagca	480
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<210> 89

<211> 1860

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (1846)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (1848)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (1853)

<223> n equals a,t,g, or c

<400> 89

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ccccacccgg	ggcgtgggct	atgagaccat	cctgaaagag	cagaaggggc	agagcatggt	1080

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49

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<210> 90

<211> 839

<212> DNA

<213> Homo sapiens

<400> 90

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<210> 91

<211> 1145

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (386)

<223> n equals a,t,g, or c

<400> 91

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caagacatgt	tataaaatta	tctgtnatTT	tggtagaaca	tatacattgt	yctaataata	420
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<211> 2050

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (515)

<223> n equals a,t,g, or c

<400> 92

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 <211> 1173
 <212> DNA
 <213> Homo sapiens

<400> 93
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 <211> 822
 <212> DNA
 <213> Homo sapiens

<400> 94
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<210> 95
 <211> 1077
 <212> DNA

<213> Homo sapiens

<400> 95

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<210> 96

<211> 2092

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (637)

<223> n equals a,t,g, or c

<400> 96

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<210> 97

<211> 1352

<212> DNA

<213> Homo sapiens

<400> 97

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<210> 98

<211> 913

<212> DNA

<213> Homo sapiens

<400> 98

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<210> 99

<211> 721

<212> DNA

<213> Homo sapiens

<400> 99

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<211> 645

<212> DNA

<213> Homo sapiens

<400> 100

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<210> 101

<211> 563

<212> DNA

<213> Homo sapiens

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<400> 101

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<210> 102

<211> 1324

<212> DNA

<213> Homo sapiens

<400> 102

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<210> 103

<211> 1731

<212> DNA

<213> Homo sapiens

<400> 103

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<210> 104

<211> 1466

<212> DNA

<213> Homo sapiens

<400> 104

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 <211> 1303
 <212> DNA
 <213> Homo sapiens

<400> 105
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<210> 106
 <211> 1516
 <212> DNA
 <213> Homo sapiens

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<210> 107

<211> 1689

<212> DNA

<213> Homo sapiens

<400> 107

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<211> 1943

<212> DNA

<213> Homo sapiens

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<222> (161)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (1926)

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<223> n equals a,t,g, or c

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<221> SITE

<222> (1934)

<223> n equals a,t,g, or c

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<210> 109

<211> 1594

<212> DNA

<213> Homo sapiens

<400> 109

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<210> 110

<211> 1742

<212> DNA

<213> Homo sapiens

<400> 110

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 <211> 1501
 <212> DNA
 <213> Homo sapiens

<400> 111

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 <211> 791
 <212> DNA
 <213> Homo sapiens

<400> 112

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<212> DNA

<213> Homo sapiens

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<211> 1588

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (778)

<223> n equals a,t,g, or c

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<223> n equals a,t,g, or c

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<210> 115

<211> 1926

<212> DNA

<213> Homo sapiens

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<211> 1063

<212> DNA

<213> Homo sapiens

<400> 116

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<210> 117

<211> 1615

<212> DNA

<213> Homo sapiens

<400> 117

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<210> 118

<211> 1221

<212> DNA

<213> Homo sapiens

<220>

<221> SITE

<222> (697)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (700)

<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (701)

<223> n equals a,t,g, or c

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<221> SITE

<222> (712)

<223> n equals a,t,g, or c

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<221> SITE

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<223> n equals a,t,g, or c

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<221> SITE

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<220>

<221> SITE

<222> (742)

<223> n equals a,t,g, or c

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<400> 118

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<210> 119

<211> 1149

<212> DNA

<213> Homo sapiens

<220>

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<223> n equals a,t,g, or c

<220>

<221> SITE

<222> (1140)

<223> n equals a,t,g, or c

<400> 119

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cagaaaattg	acctatgtaa	tgaataacta	gaagaaaact	ctaaattaga	atggctttgt	180
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cctaaaaaatg	tgttgatctt	gagatcatca	tatatgtagt	attacagtgc	aaacactatt	300
aatgttaatg	aggtaggtgg	atttttttaa	tgaaaaaact	tgaaatatta	tcaggttgtc	360
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67

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<210> 120
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 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (69)
 <223> n equals a,t,g, or c

<400> 120						
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<210> 121
 <211> 1025
 <212> DNA
 <213> Homo sapiens

<400> 121						
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68

atgaatataa	tatagctctg	tgtttttaaac	ctcagaaaca	gatttgagtg	tttcagtatt	420
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<210> 122

<211> 2207

<212> DNA

<213> Homo sapiens

<400> 122

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<210> 123
 <211> 1770
 <212> DNA
 <213> Homo sapiens

<400> 123

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gaaggactgc	aattgccaga	agctctattt	agacctggac	gtcatccggg	agggccagag	1560
ggacggccag	cgtgcccttg	aggagaccca	ggtgagcctg	gacgagcggc	ggcagctgga	1620
cggctcctcc	ctgcaggccc	tgagaaacgc	cgtggacgcc	gtgtcgctgg	ccgtggacgc	1680
gcacaaagcg	gagggcgagc	gggcgcgggc	ggccacgtcg	cggctccgga	gccaagtgca	1740
ggcgctggat	gacgaggtgg	gcgcgctgaa				1770

<210> 124
 <211> 1034
 <212> DNA
 <213> Homo sapiens

<400> 124

ggcacgagga	aagtacgagt	cggctcagcc	tggagggacc	caaccagagc	ctggcctggg	60
agccaggatg	gccatccaca	aagccttggg	gatgtgcctg	ggactgcctc	tcttctgtt	120
cccaggggccc	tgggcccagg	gccatgtccc	accgggctgc	agccaaggcc	tcaaccccct	180
gtactacaac	ctgtgtgacc	gctctggggc	gtggggcatc	gtcctggagg	ccgtggctgg	240
ggcggggcatt	gtcaccacgt	ttgtgctcac	catcatcctg	gtggccagcc	tcccctttgt	300
gcaggacacc	aagaaacgga	gcctgctggg	gacctagcta	agaggccggg	gtcaccatac	360
agcgggtaca	atgggcagct	gctgaccagt	gtgtaccagc	ccactgagat	ggccctgatg	420
cacaaagtgc	cgtccgaagg	agcttacgac	atcatcctcc	cacgggccac	cgccaacagc	480
caggtgatgg	gcagtgccaa	ctcgaccctg	cgggctgaag	acatgtactc	ggcccagagc	540
caccaggcgg	ccacaccgcc	gaaagacggc	aagaactctc	aggtctttag	aaacccctac	600
gtgtgggact	gagtcagcgg	tggcgaggag	aygcggctcg	atttggggag	ggccctgagg	660

SUBSTITUTE SHEET (RULE 26)

70

```

acctggcccc gggcaagggg ctctccaggc tcctcctccc cctggcaggc ccagcaacat      720
gtgccccaga tgtggaaggg cctccctctc tgccagtgtt tgggtgggtg tcatgggtgt      780
ccccacccac tcctcagtgt ttgtggagtc gaggagccaa cccagcctc ctgccaggat      840
cacctcggcg gtcacactcc agccaaatag tgttctcggg gtggtggctg ggcagcgctt      900
atgtttctct ggagattcct gcaacctcaa gagacttccc aggcgctcag gcctggatct      960
tgctcctctg tgaggaacaa gggcgccctaa taaatacatt tctgctttat taaaaaaaaa     1020
aaaaaaaaaa aaaa                                     1034

```

<210> 125

<211> 353

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (353)

<223> Xaa equals stop translation

<400> 125

```

Met Leu Cys Arg Leu Cys Trp Leu Val Ser Tyr Ser Leu Ala Val Leu
  1             5             10             15

```

```

Leu Leu Gly Cys Leu Leu Phe Leu Arg Lys Ala Ala Lys Pro Ala Glu
      20             25             30

```

```

Thr Pro Arg Pro Thr Ser Leu Ser Gly Ala Pro Pro Thr Pro Arg His
      35             40             45

```

```

Ser Arg Cys Pro Pro Asn His Thr Val Ser Ser Ala Ser Leu Ser Leu
      50             55             60

```

```

Pro Ser Arg His Arg Leu Phe Leu Thr Tyr Arg His Cys Arg Asn Phe
      65             70             75             80

```

```

Ser Ile Leu Leu Glu Pro Ser Gly Cys Ser Lys Asp Thr Phe Leu Leu
      85             90             95

```

```

Leu Ala Ile Lys Ser Gln Pro Gly His Val Glu Arg Arg Ala Ala Ile
      100            105            110

```

```

Arg Ser Thr Trp Gly Arg Trp Gly Asp Gly Leu Gly Pro Ala Leu Lys
      115            120            125

```

```

Leu Val Phe Leu Leu Gly Val Ala Gly Ser Ala Pro Pro Ala Gln Leu
      130            135            140

```

```

Leu Ala Tyr Glu Ser Arg Glu Phe Asp Asp Ile Leu Gln Trp Asp Phe
      145            150            155            160

```

```

Thr Glu Asp Phe Phe Asn Leu Thr Leu Lys Glu Leu His Leu Gln Arg
      165            170            175

```

```

Trp Val Val Ala Ala Cys Pro Gln Ala His Phe Met Leu Lys Gly Asp
      180            185            190

```

```

Asp Asp Val Phe Val His Val Pro Asn Val Leu Glu Phe Leu Asp Gly

```

SUBSTITUTE SHEET (RULE 26)

71

195	200	205
Trp Asp Pro Ala Gln Asp Leu Leu Val Gly Asp Val Ile Arg Gln Ala 210	215	220
Leu Pro Asn Arg Asn Thr Lys Val Lys Tyr Phe Ile Pro Pro Ser Met 225	230	235 240
Tyr Arg Ala Thr His Tyr Pro Pro Tyr Ala Gly Gly Gly Gly Tyr Val 245	250	255
Met Ser Arg Ala Thr Val Arg Arg Leu Gln Ala Ile Met Glu Asp Ala 260	265	270
Glu Leu Phe Pro Ile Asp Asp Val Phe Val Gly Met Cys Leu Arg Arg 275	280	285
Leu Gly Leu Ser Pro Met His His Ala Gly Phe Lys Thr Phe Gly Ile 290	295	300
Arg Arg Pro Leu Asp Pro Leu Asp Pro Cys Leu Tyr Arg Gly Leu Leu 305	310	315 320
Leu Val His Arg Leu Ser Pro Leu Glu Met Trp Thr Met Trp Ala Leu 325	330	335
Val Thr Asp Glu Gly Leu Lys Cys Ala Ala Gly Pro Ile Pro Gln Arg 340	345	350

Xaa

<210> 126

<211> 158

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (108)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (156)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (158)

<223> Xaa equals stop translation

<400> 126

Met Ser Trp Val Gly Leu Gly Arg Arg Gly His Leu Leu Leu Ile
1 5 10 15

SUBSTITUTE SHEET (RULE 26)

72

Asn Pro Arg Ala Leu Ala Gly Ile Arg Leu Pro Ser Pro Thr Gly Ala
 20 25 30
 Pro Ala Pro Gly Pro Cys Pro Pro Leu Cys Thr Pro His Cys Ser Arg
 35 40 45
 Glu His Pro Ala Gly Gly Thr Gly His Pro Ala Gly Val Trp Trp Arg
 50 55 60
 Arg Gly Cys Tyr Gly Gly Ser Cys Pro Met Gly Pro Val Arg Gly Ile
 65 70 75 80
 Leu Gly Gly Leu Pro Cys Arg Glu Glu Ala Leu Arg Arg His His Ser
 85 90 95
 Lys Pro Cys Trp Arg Pro Gly Gly Gln Ala Arg Xaa Leu Gly Ser Trp
 100 105 110
 Pro Leu Thr Ala Gly Arg Glu Pro Pro Arg Thr Ala Ser Thr Ala Pro
 115 120 125
 His Thr Ser Glu Pro Thr Ser Ser Phe Pro Arg Phe Pro Arg Ser Gln
 130 135 140
 Ala Trp Glu Asp Leu Pro Asp Ala Ala His His Xaa Ser Xaa
 145 150 155

<210> 127

<211> 554

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (39)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (199)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (201)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (202)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (228)

<223> Xaa equals any of the naturally occurring L-amino acids

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (420)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (434)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (440)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (452)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (554)

<223> Xaa equals stop translation

<400> 127

Met	Lys	Ile	Ala	Thr	Val	Ser	Val	Leu	Leu	Pro	Leu	Ala	Leu	Cys	Leu
1					5				10					15	

Ile	Gln	Asp	Ala	Ala	Ser	Lys	Asn	Glu	Asp	Gln	Glu	Met	Cys	His	Glu
			20					25					30		

Phe	Gln	Ala	Phe	Met	Lys	Xaa	Gly	Lys	Leu	Phe	Cys	Pro	Gln	Asp	Lys
		35					40					45			

Lys	Phe	Phe	Gln	Ser	Leu	Asp	Gly	Ile	Met	Phe	Ile	Asn	Lys	Cys	Ala
	50					55					60				

Thr	Cys	Lys	Met	Ile	Leu	Glu	Lys	Glu	Ala	Lys	Ser	Gln	Lys	Arg	Ala
65					70					75					80

Arg	His	Leu	Ala	Arg	Ala	Pro	Lys	Ala	Thr	Ala	Pro	Thr	Glu	Leu	Asn
				85					90					95	

Cys	Asp	Asp	Phe	Lys	Lys	Gly	Glu	Arg	Asp	Gly	Asp	Phe	Ile	Cys	Pro
			100					105					110		

Asp	Tyr	Tyr	Glu	Ala	Val	Cys	Gly	Thr	Asp	Gly	Lys	Thr	Tyr	Asp	Asn
		115					120					125			

Arg	Cys	Ala	Leu	Cys	Ala	Glu	Asn	Ala	Lys	Thr	Gly	Ser	Gln	Ile	Gly
		130				135					140				

Val	Lys	Ser	Glu	Gly	Glu	Cys	Lys	Ser	Ser	Asn	Pro	Glu	Gln	Asp	Val
145					150					155					160

SUBSTITUTE SHEET (RULE 26)

74

Cys	Ser	Ala	Phe	Arg	Pro	Phe	Val	Arg	Asp	Gly	Arg	Leu	Gly	Cys	Thr	165	170	175
Arg	Glu	Asn	Asp	Pro	Val	Leu	Gly	Pro	Asp	Gly	Lys	Thr	His	Gly	Asn	180	185	190
Lys	Cys	Ala	Met	Cys	Ala	Xaa	Leu	Xaa	Xaa	Lys	Glu	Ala	Glu	Asn	Ala	195	200	205
Lys	Arg	Glu	Gly	Glu	Thr	Arg	Ile	Arg	Arg	Asn	Ala	Glu	Lys	Asp	Phe	210	215	220
Cys	Lys	Glu	Xaa	Glu	Lys	Gln	Val	Arg	Asn	Gly	Arg	Leu	Phe	Cys	Thr	225	230	235
Arg	Glu	Ser	Asp	Pro	Val	Arg	Gly	Pro	Asp	Gly	Arg	Met	His	Gly	Asn	245	250	255
Lys	Cys	Ala	Leu	Cys	Ala	Glu	Ile	Phe	Lys	Gln	Arg	Phe	Ser	Glu	Glu	260	265	270
Asn	Ser	Lys	Thr	Asp	Gln	Asn	Leu	Gly	Lys	Ala	Glu	Glu	Lys	Thr	Lys	275	280	285
Val	Lys	Arg	Glu	Ile	Val	Lys	Leu	Cys	Ser	Gln	Tyr	Gln	Asn	Gln	Ala	290	295	300
Lys	Asn	Gly	Ile	Leu	Phe	Cys	Thr	Arg	Glu	Asn	Asp	Pro	Ile	Arg	Gly	305	310	315
Pro	Asp	Gly	Lys	Met	His	Gly	Asn	Leu	Cys	Ser	Met	Cys	Gln	Ala	Tyr	325	330	335
Phe	Gln	Ala	Glu	Asn	Glu	Glu	Lys	Lys	Lys	Ala	Glu	Ala	Arg	Ala	Arg	340	345	350
Asn	Lys	Arg	Glu	Ser	Gly	Lys	Ala	Thr	Ser	Tyr	Ala	Glu	Leu	Cys	Ser	355	360	365
Glu	Tyr	Arg	Lys	Leu	Val	Arg	Asn	Gly	Lys	Leu	Ala	Cys	Thr	Arg	Glu	370	375	380
Asn	Asn	Pro	Ile	Gln	Gly	Pro	Asp	Gly	Lys	Val	His	Gly	Asn	Thr	Cys	385	390	395
Ser	Met	Cys	Glu	Val	Phe	Phe	Gln	Ala	Glu	Glu	Glu	Glu	Lys	Lys	Lys	405	410	415
Lys	Glu	Gly	Xaa	Ser	Arg	Asn	Lys	Arg	Gln	Ser	Lys	Ser	Thr	Ala	Ser	420	425	430
Phe	Xaa	Glu	Leu	Cys	Ser	Glu	Xaa	Arg	Lys	Ser	Arg	Lys	Asn	Gly	Arg	435	440	445
Leu	Phe	Cys	Xaa	Arg	Glu	Asn	Asp	Pro	Ile	Gln	Gly	Pro	Asp	Gly	Lys	450	455	460

SUBSTITUTE SHEET (RULE 26)

75

Met His Gly Asn Thr Cys Ser Met Cys Glu Ala Phe Phe Gln Gln Glu
 465 470 475 480

Glu Arg Ala Arg Ala Lys Ala Lys Arg Glu Ala Ala Lys Glu Ile Cys
 485 490 495

Ser Glu Phe Arg Asp Gln Val Arg Asn Gly Thr Leu Ile Cys Thr Arg
 500 505 510

Glu His Asn Pro Val Arg Gly Pro Asp Gly Lys Met His Gly Asn Lys
 515 520 525

Cys Ala Met Cys Ala Ser Val Phe Lys Leu Glu Lys Lys Lys Lys Lys
 530 535 540

Lys Lys Lys Lys Lys Gly Arg Pro Leu Xaa
 545 550

<210> 128

<211> 308

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (308)

<223> Xaa equals stop translation

<400> 128

Met Asn Thr Val Leu Leu Ser Leu Leu Phe Ser Leu Pro Arg Ile Val
 1 5 10 15

Tyr Ala Met Ala Ala Asp Gly Leu Phe Phe Gln Val Phe Ala His Val
 20 25 30

His Pro Arg Thr Gln Val Pro Val Ala Gly Thr Leu Ala Phe Gly Leu
 35 40 45

Leu Thr Ala Phe Leu Ala Leu Leu Leu Asp Leu Glu Ser Leu Val Gln
 50 55 60

Phe Leu Ser Leu Gly Thr Leu Leu Ala Tyr Thr Phe Val Ala Thr Ser
 65 70 75 80

Ile Ile Val Leu Arg Phe Gln Lys Ser Ser Pro Pro Ser Ser Pro Gly
 85 90 95

Pro Ala Ser Pro Gly Pro Leu Thr Lys Gln Gln Ser Ser Phe Ser Asp
 100 105 110

His Leu Gln Leu Val Gly Thr Val His Ala Ser Val Pro Glu Pro Gly
 115 120 125

Glu Leu Lys Pro Ala Leu Arg Pro Tyr Leu Gly Phe Leu Asp Gly Tyr
 130 135 140

SUBSTITUTE SHEET (RULE 26)

76

Ser Pro Gly Ala Val Val Thr Trp Ala Leu Gly Val Met Leu Ala Ser
 145 150 155 160
 Ala Ile Thr Ile Gly Cys Val Leu Val Phe Gly Asn Ser Thr Leu His
 165 170 175
 Leu Pro His Trp Gly Tyr Ile Leu Leu Leu Leu Thr Ser Val Met
 180 185 190
 Phe Leu Leu Ser Leu Leu Val Leu Gly Ala His Gln Gln Gln Tyr Arg
 195 200 205
 Glu Asp Leu Phe Gln Ile Pro Met Val Pro Leu Ile Pro Ala Leu Ser
 210 215 220
 Ile Val Leu Asn Ile Cys Leu Met Leu Lys Leu Ser Tyr Leu Thr Trp
 225 230 235 240
 Val Arg Phe Ser Ile Trp Leu Leu Met Gly Leu Ala Val Tyr Phe Gly
 245 250 255
 Tyr Gly Ile Arg His Ser Lys Glu Asn Gln Arg Glu Leu Pro Gly Leu
 260 265 270
 Asn Ser Thr His Tyr Val Val Phe Pro Arg Gly Ser Leu Glu Glu Thr
 275 280 285
 Val Gln Ala Met Gln Pro Pro Ser Gln Ala Pro Ala Gln Asp Pro Gly
 290 295 300
 His Met Glu Xaa
 305

<210> 129
 <211> 167
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (167)
 <223> Xaa equals stop translation

<400> 129
 Met Ala Ala Ala Val Leu Ala Met Thr Leu Ala Pro Thr Val Ser Gly
 1 5 10 15
 Thr Thr Ser Lys Cys Ser Ser Arg Arg Trp Cys Pro Val Pro Ala Ser
 20 25 30
 Ser Ser Cys Val Ser His Leu Leu Gly Ser Gly Cys Ala Pro Cys Ala
 35 40 45
 Pro Trp Thr Ala His Pro Arg Gln Pro Ser Gln Cys Trp Ser Ala Arg
 50 55 60

SUBSTITUTE SHEET (RULE 26)

77

Ala Pro Arg Arg Leu Gly Ser Arg Pro Arg Arg Tyr Leu Leu Thr Gly
 65 70 75 80

Gln Ala Asn Gly Ser Leu Ala Met Trp Asp Leu Thr Thr Ala Met Asp
 85 90 95

Gly Leu Gly Gln Ala Pro Ala Gly Gly Leu Thr Glu Gln Glu Leu Met
 100 105 110

Glu Gln Leu Glu His Cys Glu Leu Ala Pro Pro Ala Pro Phe Ser Ser
 115 120 125

Leu Met Gly Leu Ser Pro Gln Pro Leu Thr Pro His Leu Pro His Gln
 130 135 140

Pro Pro Leu Ser Leu Gln Gln His Leu Leu Val Trp Pro Pro Trp Glu
 145 150 155 160

Pro Lys Pro Pro Ala Gly Xaa
 165

<210> 130

<211> 306

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (306)

<223> Xaa equals stop translation

<400> 130

Met Ala Ala Gly Leu Ala Arg Leu Leu Leu Leu Leu Gly Leu Ser Ala
 1 5 10 15

Gly Gly Pro Ala Pro Ala Gly Ala Ala Lys Met Lys Val Val Glu Glu
 20 25 30

Pro Asn Ala Phe Gly Val Asn Asn Pro Phe Leu Pro Gln Ala Ser Arg
 35 40 45

Leu Gln Ala Lys Arg Asp Pro Ser Pro Val Ser Gly Pro Val His Leu
 50 55 60

Phe Arg Leu Ser Gly Lys Cys Phe Ser Leu Val Glu Ser Thr Tyr Lys
 65 70 75 80

Tyr Glu Phe Cys Pro Phe His Asn Val Thr Gln His Glu Gln Thr Phe
 85 90 95

Arg Trp Asn Ala Tyr Ser Gly Ile Leu Gly Ile Trp His Glu Trp Glu
 100 105 110

Ile Ala Asn Asn Thr Phe Thr Gly Met Trp Met Arg Asp Gly Asp Ala
 115 120 125

SUBSTITUTE SHEET (RULE 26)

78

Cys Arg Ser Arg Ser Arg Gln Ser Lys Val Glu Leu Ala Cys Gly Lys
 130 135 140
 Ser Asn Arg Leu Ala His Val Ser Glu Pro Ser Thr Cys Val Tyr Ala
 145 150 155 160
 Leu Thr Phe Glu Thr Pro Leu Val Cys His Pro His Ala Leu Leu Val
 165 170 175
 Tyr Pro Thr Leu Pro Glu Ala Leu Gln Arg Gln Trp Asp Gln Val Glu
 180 185 190
 Gln Asp Leu Ala Asp Glu Leu Ile Thr Pro Gln Gly His Glu Lys Leu
 195 200 205
 Leu Arg Thr Leu Phe Glu Asp Ala Gly Tyr Leu Lys Thr Pro Glu Glu
 210 215 220
 Asn Glu Pro Thr Gln Leu Glu Gly Gly Pro Asp Ser Leu Gly Phe Glu
 225 230 235 240
 Thr Leu Glu Asn Cys Arg Lys Ala His Lys Glu Leu Ser Lys Glu Ile
 245 250 255
 Lys Arg Leu Lys Gly Leu Leu Thr Gln His Gly Ile Pro Tyr Thr Arg
 260 265 270
 Pro Thr Glu Thr Ser Asn Leu Glu His Leu Gly His Glu Thr Pro Arg
 275 280 285
 Ala Lys Ser Pro Glu Gln Leu Arg Gly Asp Pro Gly Leu Arg Gly Ser
 290 295 300
 Leu Xaa
 305

<210> 131

<211> 220

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (56)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (58)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (204)

<223> Xaa equals any of the naturally occurring L-amino acids

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (209)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (220)

<223> Xaa equals stop translation

<400> 131

Met	Pro	Cys	Leu	Glu	Ala	Val	Ala	Leu	Ile	Leu	Leu	Ile	Leu	Leu	Val
1				5					10					15	

Pro	Asp	Pro	Pro	Arg	Gly	Ala	Ala	Glu	Thr	Gln	Gly	Glu	Gly	Ala	Val
			20					25					30		

Gly	Gly	Phe	Arg	Ser	Ser	Trp	Cys	Glu	Asp	Val	Arg	Tyr	Leu	Gly	Lys
		35					40					45			

Asn	Trp	Ser	Phe	Val	Trp	Ser	Xaa	Leu	Xaa	Val	Thr	Ala	Met	Ala	Phe
	50					55					60				

Val	Thr	Gly	Ala	Leu	Gly	Phe	Trp	Ala	Pro	Lys	Phe	Leu	Leu	Glu	Ala
65					70					75					80

Arg	Val	Val	His	Gly	Leu	Gln	Pro	Pro	Cys	Phe	Gln	Glu	Pro	Cys	Ser
				85					90					95	

Asn	Pro	Asp	Ser	Leu	Ile	Phe	Gly	Ala	Leu	Thr	Ile	Met	Thr	Gly	Val
			100					105						110	

Ile	Gly	Val	Ile	Leu	Gly	Ala	Glu	Ala	Ala	Arg	Arg	Tyr	Lys	Lys	Val
	115						120					125			

Ile	Pro	Gly	Ala	Glu	Pro	Leu	Ile	Cys	Ala	Ser	Ser	Leu	Leu	Ala	Thr
	130					135					140				

Ala	Pro	Cys	Leu	Tyr	Leu	Ala	Leu	Val	Leu	Ala	Pro	Thr	Thr	Leu	Leu
145					150					155					160

Ala	Ser	Tyr	Val	Phe	Leu	Gly	Leu	Gly	Glu	Leu	Leu	Leu	Ser	Cys	Asn
				165					170					175	

Trp	Ala	Val	Val	Ala	Asp	Ile	Leu	Leu	Ser	Val	Val	Val	Pro	Arg	Cys
				180				185						190	

Arg	Gly	Thr	Ala	Glu	Ala	Leu	Gln	Ile	Thr	Val	Xaa	His	Ile	Leu	Gly
		195					200					205			

Xaa	Leu	Ala	Ala	Leu	Ser	His	Arg	Thr	Tyr	Leu	Xaa
	210					215					220

<210> 132

<211> 99

<212> PRT

SUBSTITUTE SHEET (RULE 26)

<213> Homo sapiens

<220>

<221> SITE

<222> (99)

<223> Xaa equals stop translation

<400> 132

Met Met Asn Gln His Leu Leu Glu Ser Phe Gly Ser Pro Ser Ser Leu
1 5 10 15

Phe Ile Val Phe Ile Leu Leu Ile Trp Met Leu Gln Arg Cys Lys Asp
20 25 30

Phe Phe Leu Cys Cys Tyr Arg Val Val Leu Thr Pro Ser Phe Trp Gln
35 40 45

Lys His Gln His Pro Asp Pro Lys Ile Lys His His Leu Lys Leu Tyr
50 55 60

Ser Leu Lys Tyr Ser Ser Ser Gly Gln Asn Asn Phe Arg Lys Asp Lys
65 70 75 80

His Trp Leu Ser Gly His Thr Glu Glu Ala Asn Leu Ile Lys Glu Glu
85 90 95

Trp Lys Xaa

<210> 133

<211> 61

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (61)

<223> Xaa equals stop translation

<400> 133

Met Thr Ser Ser Leu Phe Ile Phe Leu Phe Leu Trp Phe Cys Pro Pro
1 5 10 15

Pro Arg Ile Ser Phe Val Leu Cys Trp Pro Gln Pro His Ser Gln Val
20 25 30

His Ile Gln His Glu Lys Ala Asp His Leu Phe Gln Ser Leu Lys Gln
35 40 45

Lys Ala Pro Gly Leu Leu Gln Trp Ala Arg Ile Val Xaa
50 55 60

<210> 134

<211> 248

<212> PRT

SUBSTITUTE SHEET (RULE 26)

<213> Homo sapiens

<220>

<221> SITE

<222> (14)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (141)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (248)

<223> Xaa equals stop translation

<400> 134

Met Ala Val Pro Ala Leu Thr Pro Ala Ala Val Arg Ala Xaa Gly Leu
1 5 10 15

Leu Gly Val Ser Trp Thr Trp Ala Leu Phe Thr Pro Leu Val Ala Leu
20 25 30

Gly Arg Glu Gly Gly Ser Gln Asp Ser Ala Thr Thr Pro Ser Arg Pro
35 40 45

Pro Gly Arg Pro Arg Ile Val Asp Ile Ala Thr Ile Val His Cys Tyr
50 55 60

Ala Glu Glu Arg Gln Ser Ala Glu Asp Tyr Glu Lys Glu Glu Ser His
65 70 75 80

Arg Gln Arg Arg Leu Lys Glu Arg Glu Arg Ile Gly Glu Leu Gly Ala
85 90 95

Pro Glu Val Trp Gly Pro Ser Pro Lys Phe Pro Gln Leu Asp Ser Asp
100 105 110

Glu His Thr Pro Val Glu Asp Glu Glu Glu Val Thr His Gln Lys Ser
115 120 125

Ser Ser Ser Asp Ser Asn Ser Glu Glu His Arg Lys Xaa Lys Thr Ser
130 135 140

Arg Ser Arg Asn Lys Lys Lys Arg Lys Asn Lys Ser Ser Lys Arg Lys
145 150 155 160

His Arg Lys Tyr Ser Asp Ser Asp Ser Asn Ser Glu Ser Asp Thr Asn
165 170 175

Ser Asp Ser Asp Asp Asp Lys Lys Arg Val Lys Ala Lys Lys Lys Lys
180 185 190

Lys Lys Lys Lys His Lys Thr Lys Lys Lys Lys Asn Lys Lys Thr Lys
195 200 205

SUBSTITUTE SHEET (RULE 26)

82

Lys Glu Ser Ser Asp Ser Ser Cys Lys Asp Ser Glu Glu Asp Leu Ser
 210 215 220

Glu Ala Thr Trp Asp Gly Ala Ala Lys Cys Gly Arg Tyr Tyr Gly Phe
 225 230 235 240

Asn Arg Ala Arg Ser Thr Tyr Xaa
 245

<210> 135
 <211> 41
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (41)
 <223> Xaa equals stop translation

<400> 135
 Met Val Cys Phe Tyr Ala Leu Leu Leu Cys Phe Leu Ser Ser Val Glu
 1 5 10 15

Ile Gly Pro Leu Ser Trp Leu Leu Cys Leu Ser His Ile Lys Cys His
 20 25 30

Phe Thr Ala Leu Pro Phe Glu Ala Xaa
 35 40

<210> 136
 <211> 75
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (75)
 <223> Xaa equals stop translation

<400> 136
 Met Leu His Leu Phe Cys Ser Gln Pro Leu Gly Leu Leu Phe Leu Leu
 1 5 10 15

Ile Phe Leu Gly Leu Asp Ser Leu Pro Arg Cys Leu Thr Ala Thr Arg
 20 25 30

Leu Gln Ser Pro Ile Ile Ile Phe Ser Thr Leu Ser Cys Ile Cys Ser
 35 40 45

Thr Ser Trp Leu Glu Leu Cys Ser Val Tyr Phe Leu Thr Leu Asn Tyr
 50 55 60

Leu His Val Val Pro Pro Cys Phe Leu Ile Xaa
 65 70 75

SUBSTITUTE SHEET (RULE 26)

<210> 137

<211> 75

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (75)

<223> Xaa equals stop translation

<400> 137

Met	Gly	Val	Leu	Thr	Arg	Glu	Leu	Phe	Gly	Val	Val	Gly	Met	Leu	Tyr
1				5					10					15	

Ile	Leu	Ile	Val	Gly	Met	Val	Thr	Trp	Leu	Asp	Ala	Phe	Val	Lys	Thr
			20					25						30	

His	Leu	Met	Val	Met	Gln	Asn	Glu	Tyr	Ile	Leu	Phe	Tyr	Val	Asn	Tyr
		35					40					45			

Thr	Ser	Lys	Leu	Asn	Phe	Phe	Lys	Lys	Phe	Leu	Leu	Lys	Ser	Lys	Asp
	50					55						60			

Ile	Cys	Gly	Ala	Ser	Cys	Lys	Phe	Tyr	Cys	Xaa
65					70					75

<210> 138

<211> 58

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (58)

<223> Xaa equals stop translation

<400> 138

Met	Lys	Val	Leu	Leu	Ser	Leu	Ser	Leu	Val	Gly	Leu	Phe	Ile	Gly	Phe
1				5					10					15	

Ser	Asp	Ala	Val	Leu	Asn	Glu	Thr	Cys	Arg	Phe	Trp	Ile	Asn	Thr	Ser
		20						25					30		

Ser	Lys	Gly	Asn	Leu	Gln	Ile	Leu	Lys	Asn	Gln	Ile	Gln	Ile	Ile	Asp
		35					40					45			

Arg	Leu	Arg	Lys	Met	Pro	Ala	Ser	Ala	Xaa
	50					55			

<210> 139

<211> 173

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (76)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (124)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 139

Met	Leu	Gly	Ser	Pro	Cys	Leu	Leu	Trp	Leu	Leu	Ala	Val	Thr	Phe	Leu
1				5				10						15	

Val	Pro	Arg	Ala	Gln	Pro	Leu	Ala	Pro	Gln	Asp	Phe	Glu	Glu	Glu	Glu
			20					25					30		

Ala	Asp	Glu	Thr	Glu	Thr	Ala	Trp	Pro	Pro	Leu	Pro	Ala	Val	Pro	Cys
		35					40					45			

Asp	Tyr	Asp	His	Cys	Arg	His	Leu	Gln	Val	Pro	Cys	Lys	Glu	Leu	Gln
	50					55					60				

Arg	Val	Gly	Pro	Ala	Ala	Cys	Leu	Cys	Pro	Gly	Xaa	Ser	Ser	Pro	Ala
65					70					75					80

Gln	Pro	Pro	Asp	Pro	Pro	Arg	Met	Gly	Glu	Val	Arg	Ile	Ala	Ala	Glu
				85					90					95	

Glu	Gly	Arg	Ala	Val	Val	His	Trp	Cys	Ala	Pro	Phe	Ser	Pro	Val	Leu
			100					105					110		

His	Tyr	Trp	Leu	Leu	Leu	Trp	Asp	Gly	Ser	Glu	Xaa	Arg	Arg	Arg	Gly
		115					120					125			

Pro	Pro	Leu	Asn	Ala	Thr	Val	Arg	Arg	Ala	Glu	Leu	Lys	Gly	Leu	Lys
	130					135					140				

Pro	Gly	Gly	Ile	Tyr	Val	Val	Cys	Val	Val	Ala	Ala	Asn	Glu	Ala	Gly
145					150					155					160

Ala	Ser	Arg	Val	Pro	Gln	Ala	Gly	Gly	Glu	Gly	Leu	Glu
				165					170			

<210> 140

<211> 46

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (46)

<223> Xaa equals stop translation

<400> 140

Met Thr Ile His Ala Leu Leu Val Tyr Ala Cys Asn Ser Lys Cys Leu

SUBSTITUTE SHEET (RULE 26)

85

1

5

10

15

Trp Phe Ser Ile Ser His Leu His Phe Cys Leu Val Thr Leu Leu Ile
 20 25 30

Leu Thr Asn Met Thr Glu Ser Ser Phe Ser Leu Lys Gly Xaa
 35 40 45

<210> 141

<211> 58

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (58)

<223> Xaa equals stop translation

<400> 141

Met Val Tyr Arg Ala Phe Leu Ile Ile Ile Leu Arg Phe Ile Leu Ile
 1 5 10 15

Phe Leu Phe Lys Leu Asn Tyr Ser Lys Leu Cys Pro Glu Ile Pro Phe
 20 25 30

Gly Leu Lys Phe Phe Ser Phe Val Cys Ile Lys Val Gln Ile Lys Lys
 35 40 45

Thr Ser Arg Lys Arg Arg Pro Tyr Leu Xaa
 50 55

<210> 142

<211> 67

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (67)

<223> Xaa equals stop translation

<400> 142

Met Phe Val Glu Arg Trp Leu Pro Cys Phe Leu Val Val Ala Val Val
 1 5 10 15

Val Trp Val Phe Ala Cys Gly Pro Val Glu Asp Lys Glu Asp Ser Phe
 20 25 30

Gly Trp Ser Ser Tyr Phe Leu Ala Ser Gly Leu Pro Pro Leu Leu Phe
 35 40 45

Glu Ala Ser Gln Thr Arg Thr Val Arg Ala Gly Arg Leu Gly Val Phe
 50 55 60

Val Cys Xaa

SUBSTITUTE SHEET (RULE 26)

65

<210> 143

<211> 53

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (53)

<223> Xaa equals stop translation

<400> 143

Met Ile Phe Lys Leu Leu Ile Phe Arg Ile Phe Phe His Glu Leu Ala
 1 5 10 15

Leu Ala Leu Cys Ile Ser Asn Leu Val Ser Leu Pro Trp Leu Ser Tyr
 20 25 30

Phe Trp Cys Pro Glu Met Gln Asn Leu Phe Leu Leu Asp Thr His Ile
 35 40 45

Trp Val Leu Met Xaa
 50

<210> 144

<211> 66

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (66)

<223> Xaa equals stop translation

<400> 144

Met Val Leu Ser Val Ala Leu Leu His Ala Leu Ser His Leu Met Pro
 1 5 10 15

Cys Lys Thr Cys Leu Ala Ser Thr Ser Pro Ser Ala Met Ile Val Ser
 20 25 30

Phe Leu Arg Pro Pro Gln Pro Ala Met Trp Asn Cys Glu Ser Ile Lys
 35 40 45

Pro Phe Leu Phe Ile His Tyr Pro Val Ser Gly Ser Ile Phe Ile Ala
 50 55 60

Val Xaa
 65

<210> 145

<211> 57

<212> PRT

SUBSTITUTE SHEET (RULE 26)

<213> Homo sapiens

<220>

<221> SITE

<222> (57)

<223> Xaa equals stop translation

<400> 145

```
Met Val Ala Ile Leu Leu Arg Glu Leu Pro Leu Ala Phe Leu Leu Val
  1             5             10             15

Gly Ser Ser Gly Asp Lys Phe Cys Phe Thr Ser Ser Glu Asn Val Leu
          20             25             30

Leu Ser Phe Ser Phe Leu Lys Asp Ile Phe Ala Gly Tyr Lys Asn Ser
          35             40             45

Gly Leu Met Val Leu Phe Ile Val Xaa
  50             55
```

<210> 146

<211> 67

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (67)

<223> Xaa equals stop translation

<400> 146

```
Met Ser Asn Phe Ile Ser Ile Thr Cys Leu Val Phe Thr Ile Leu Gly
  1             5             10             15

His Leu Val Ser Leu Gln Val Ala His Ser Ser Val Phe Glu Phe Lys
          20             25             30

Thr Leu Tyr Val Leu Lys Thr Asn Arg Tyr Ser Gln Ser Leu Phe Arg
          35             40             45

His Phe Cys His Leu Ser Phe Ile Arg Thr Arg Lys Ile Phe Leu Lys
          50             55             60

Asn Asn Xaa
  65
```

<210> 147

<211> 49

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (49)

<223> Xaa equals stop translation

SUBSTITUTE SHEET (RULE 26)

<400> 147

Met Met Lys Tyr Phe Phe Asp Val Val Val Phe Leu Thr Phe Phe Leu
 1 5 10 15

Val Phe Ser Leu Ser Ile Phe Leu Ser Asp Glu Glu Phe Pro Val Ser
 20 25 30

Arg Thr Gln Asn Ile Gly Leu Cys His Phe Asn Pro Ser Phe Ser Glu
 35 40 45

Xaa

<210> 148

<211> 89

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (89)

<223> Xaa equals stop translation

<400> 148

Met Leu Leu Leu Cys Leu Tyr Cys Thr Phe Phe Leu Met Pro Phe Ile
 1 5 10 15

Ile Lys Tyr Thr Cys Phe His Leu Val Phe Gly Gln Ile Pro Val Thr
 20 25 30

Val His Val Asn Ile Trp Gln His Lys Asn Val Thr Phe Phe Ile Leu
 35 40 45

His Cys Gly Ile Pro Ala Leu Thr Arg Asp Ser Ala Ala Leu Thr Tyr
 50 55 60

Ser Asn Asp Gly Thr Val Ile Glu Thr Leu Leu Phe Leu Ile Leu Tyr
 65 70 75 80

Leu Asp Leu Asn Ile Ile Cys Cys Xaa
 85

<210> 149

<211> 77

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (77)

<223> Xaa equals stop translation

<400> 149

Met Thr Leu Tyr Ser Lys Leu Leu Trp Leu Phe Lys Gly Glu Leu Leu

SUBSTITUTE SHEET (RULE 26)

89

1	5	10	15
Phe Pro Leu Val	Leu Ala Tyr Val	Leu Leu Leu Tyr	Ile Val Thr Lys
20	25	30	
Phe Asn Tyr Leu	Ile Leu Lys Leu	Phe Pro Asn Lys	Ile Gln Ile Lys
35	40	45	
Arg Gly Ser Ile	Ala Ser Asn Arg	Ser Leu Glu Ser	Ser Ala Ser Leu
50	55	60	
Pro Ala Arg Lys	Glu Glu Lys Leu	Leu Lys Lys Phe	Xaa
65	70	75	

<210> 150

<211> 42

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (42)

<223> Xaa equals stop translation

<400> 150

Met Asn Leu Ser	Phe Leu Ser Phe	Phe Leu Phe Phe	Tyr Leu Leu Trp
1	5	10	15

Ser Pro Ala Glu	Ser Val Tyr Lys	Lys Gly Met Val	Lys Lys Asn Leu
20	25	30	

Ser His Ser Ile	Val Glu Lys Ile	Lys Xaa
35	40	

<210> 151

<211> 46

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (46)

<223> Xaa equals stop translation

<400> 151

Met Asn Ala Leu	Pro Asn Leu Ala	Trp Leu Pro Phe	Val Pro Ala Leu
1	5	10	15

Ala Ala Ala Ser	Pro Ala Gly Leu	Ala Ala Pro Glu	Ser Arg Asp Val
20	25	30	

Pro Phe Pro Val	Ser Pro Ala Thr	Gln Leu Asn Ile	Gly Xaa
35	40	45	

SUBSTITUTE SHEET (RULE 26)

98

145 150 155 160
 Leu Ser Phe Pro Glu Arg Cys Gly Glu Gly Lys Gly Cys Val Gly Gly
 165 170 175
 Ala Lys Ser Ala Thr Ile Val Ala Asp Leu Ser Glu Thr Thr Ile Gln
 180 185 190
 Thr Pro Asp Gly Glu Glu Arg Leu Gly Gly Glu Ala His Ser Met Val
 195 200 205
 Trp Asp Pro Ser Gly Glu Arg Leu Ala Val Leu Met Lys Gly Lys Pro
 210 215 220
 Arg Val Gln Asp Gly Lys Pro Val Ile Leu Leu Phe Arg Thr Arg Asn
 225 230 235 240
 Ser Pro Val Phe Glu Leu Leu Pro Cys Gly Ile Ile Gln Gly Glu Pro
 245 250 255
 Gly Ala Gln Pro Gln Leu Ile Thr Phe His Leu Pro Ser Thr Lys Gly
 260 265 270
 Pro Cys Ser Val Trp Ala Gly Pro Gln Ala Glu Leu Pro Thr Ser Arg
 275 280 285
 Cys Thr Leu Ser Met Pro Ser Phe His Val Leu Ala Gln Cys Leu Gly
 290 295 300
 Gly Pro Arg Asn Pro Leu Leu Gly Val Glu Ala Leu Phe Met Thr Cys
 305 310 315 320
 Pro Ser Leu Leu Arg His Pro Gln Pro Leu Pro Leu Gly Thr Leu Ser
 325 330 335
 Gln Gly His His Leu Phe Cys Pro Thr Pro His Ile Pro Thr Ser Lys
 340 345 350
 Asn Lys Xaa
 355

<210> 169

<211> 90

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (90)

<223> Xaa equals stop translation

<400> 169

Met Cys Val Cys Tyr Phe Leu Val Phe Leu Gln Ile Trp Ala Arg Leu
 1 5 10 15

Ser His Leu Leu Val Trp Ile Tyr Pro Gly Ala Gly Leu Gln Pro Gly

SUBSTITUTE SHEET (RULE 26)

99

20

25

30

Lys Gly His Pro Ala Gln Ser Leu Phe Pro His Glu His Cys His Leu
 35 40 45

Met Pro Gln His Ser Leu Thr Leu Lys Ile Leu Glu Glu Lys Leu Gly
 50 55 60

Gly Lys Gly Glu Ser Gly Ser Asn Phe Thr Phe Leu His Cys Lys Ile
 65 70 75 80

Leu Ala Thr Ser Ala Leu Asn Phe Ser Xaa
 85 90

<210> 170

<211> 59

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (59)

<223> Xaa equals stop translation

<400> 170

Met Val Leu Pro Phe Val Leu Leu Phe Arg Pro Asn Phe Ile Ser Val
 1 5 10 15

Leu His Pro Leu Phe Tyr Ser His Cys Leu Phe Leu Tyr Leu Ile Ser
 20 25 30

Pro Val His Ser Ser Ser Ile Ile Tyr Tyr Lys Pro Asp His Cys His
 35 40 45

Tyr Thr Pro Phe Ile Pro Gly Leu Leu Gln Xaa
 50 55

<210> 171

<211> 70

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (70)

<223> Xaa equals stop translation

<400> 171

Met Leu Leu Ser Lys Glu His Thr Ser Leu Gly Trp Leu Val Ile Phe
 1 5 10 15

Leu Thr Leu Ala Ser Gln Leu Ile Ser Tyr Gly Ser Arg Thr Gly Asn
 20 25 30

Ser Arg Cys Pro Pro Cys Leu Tyr Arg Thr Leu His Thr Val Ser Thr

SUBSTITUTE SHEET (RULE 26)

100

35

40

45

Ser His Val Leu Ser Ser Leu Phe Val Ser Thr Phe Ser Gly Asp Glu
 50 55 60

Leu Val Trp Thr Thr Xaa
 65 70

<210> 172

<211> 79

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (79)

<223> Xaa equals stop translation

<400> 172

Met Val Leu Asp Phe Lys Arg Ala Gly Ser Phe Phe Leu Ser Phe Leu
 1 5 10 15

Trp Thr Arg Glu Ala Phe Ala Phe Ile Phe Thr Leu Pro Leu Leu Leu
 20 25 30

Ser Leu Cys Arg Gly Lys Met Lys Asn Ser Pro Arg Ser Asp Leu Ser
 35 40 45

Arg Leu Lys Lys Asn Val Phe Asn Ala Phe Leu Pro Cys Leu Val Pro
 50 55 60

Arg Phe Ile Ser Asn Arg Gly Cys Pro Val Tyr Arg Ser Cys Xaa
 65 70 75

<210> 173

<211> 174

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (150)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (152)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (174)

<223> Xaa equals stop translation

<400> 173

SUBSTITUTE SHEET (RULE 26)

101

Met Gly Val Pro Thr Ala Pro Glu Ala Gly Ser Trp Arg Trp Gly Ser
 1 5 10 15

Leu Leu Phe Ala Leu Phe Leu Ala Ala Ser Leu Asp Ile Thr Ala Ala
 20 25 30

Ala Leu Ala Thr Gly Ala Cys Ile Val Glu Ser Ser Ala Ser Pro Ser
 35 40 45

Ser Cys Ser Trp Ser Thr Ser Lys Gly Arg Gln Pro Pro Thr Ala Val
 50 55 60

Pro Arg Ser Trp Cys Gly Trp Thr Ala Thr Phe Lys Gly Leu Lys Thr
 65 70 75 80

Pro Ala Leu Lys Pro His His Leu Pro Arg Gly Tyr Pro Arg Pro Lys
 85 90 95

Ser Gly Thr Pro Cys Pro Met Trp Pro Ser Gly Ser Leu Leu Ser Leu
 100 105 110

Gly Gly Ile Cys Phe Arg Ser Pro Ala Pro Pro Cys Leu Leu Gln Ala
 115 120 125

Pro Glu Thr Ser Ser Ser His Pro Trp Thr Leu Ser Leu Thr Leu Gln
 130 135 140

Thr Leu Arg Ser Ser Xaa Pro Xaa Gly Gly Gln Trp Ala Val Val Ala
 145 150 155 160

Gly Ser Gly Ala Gly Ala Phe Glu Pro Gly Leu Ala Leu Xaa
 165 170

<210> 174

<211> 64

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (64)

<223> Xaa equals stop translation

<400> 174

Met Phe Val Leu Trp Val Phe Lys Ile Thr Tyr Ile Tyr Ile Leu Phe
 1 5 10 15

Ala Lys Asn Lys Ser Leu Ala Ser Cys Gln Met Ile Ala Lys Val Asp
 20 25 30

Leu Thr Phe Phe Val Ile Met Tyr Ile Phe Ile His Thr Pro Asn Thr
 35 40 45

Leu Ser Asp Phe Cys Tyr Phe Leu Gly Ser Thr Ala Leu Arg Leu Xaa
 50 55 60

<210> 175
 <211> 43
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (43)
 <223> Xaa equals stop translation

<400> 175
 Met Ile Ser Ala Gln Ser Ser Ile Ser Trp Ala Leu Ile Phe Ile Met
 1 5 10 15
 Ala Pro Ala Leu His Leu Val Leu Arg Phe Pro Ser Lys Phe Lys Pro
 20 25 30
 Glu Arg Lys Gly Glu Ala Arg Ser Pro Lys Xaa
 35 40

<210> 176
 <211> 114
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (114)
 <223> Xaa equals stop translation

<400> 176
 Met Trp Ile Ala Gly Pro Ser Trp Val Pro Leu Arg Tyr Val Val Trp
 1 5 10 15
 Leu Met His Leu Glu Arg Ile Cys Ala Leu His Asn Cys Arg Gly Asn
 20 25 30
 Met Leu Ser Trp Pro Leu Gln Ile Arg Val Ala Val Leu Gly Cys Cys
 35 40 45
 Thr Lys Thr Pro Ala Val Gly Phe Leu Gln Val Ala Gly Ser Pro His
 50 55 60
 Ser Cys Gln Asp Pro Gly Pro Cys Ser His Ser Ala Ala Ile Phe Pro
 65 70 75 80
 Pro Cys Glu Arg Gly Leu Cys Gly Asp Gly Pro Arg Cys Val Arg Gly
 85 90 95
 Cys Val His Cys His Arg Ser Leu Leu His Glu Pro Ala Trp Thr Gln
 100 105 110

SUBSTITUTE SHEET (RULE 26)

Gly Xaa

<210> 177
 <211> 156
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (156)
 <223> Xaa equals stop translation

<400> 177
 Met Ala Ser Ser Leu Ala Phe Leu Leu Leu Asn Phe His Val Ser Leu
 1 5 10 15
 Leu Leu Val Gln Leu Leu Thr Pro Cys Ser Ala Gln Phe Ser Val Leu
 20 25 30
 Gly Pro Ser Gly Pro Ile Leu Ala Met Val Gly Glu Asp Ala Asp Leu
 35 40 45
 Pro Cys His Leu Phe Pro Thr Met Ser Ala Glu Thr Met Glu Leu Lys
 50 55 60
 Trp Val Ser Ser Ser Leu Arg Gln Val Val Asn Val Tyr Ala Asp Gly
 65 70 75 80
 Lys Glu Val Glu Asp Arg Gln Ser Ala Pro Tyr Arg Gly Arg Thr Ser
 85 90 95
 Ile Leu Arg Asp Gly Ile Thr Ala Gly Lys Ala Ala Leu Arg Ile His
 100 105 110
 Asn Val Thr Ala Ser Asp Ser Gly Lys Tyr Leu Cys Tyr Phe Gln Asp
 115 120 125
 Gly Asp Phe Tyr Glu Lys Ala Leu Val Glu Leu Lys Val Ala Ala Leu
 130 135 140
 Gly Ser Asn Leu His Val Gly Ser Glu Gly Leu Xaa
 145 150 155

<210> 178
 <211> 89
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (89)
 <223> Xaa equals stop translation

<400> 178

SUBSTITUTE SHEET (RULE 26)

104

Met Trp Pro Ser Gln Val Pro Leu Leu Ala Phe Cys Phe Leu Leu Val
 1 5 10 15

Lys Ser Thr Ser Asn Ile Asn Leu Pro Thr Pro Pro Pro Ser Ser Leu
 20 25 30

Glu Asn Ser Ser Phe Val Val Ser Gln Arg Gly Asn Leu Ile Val Phe
 35 40 45

Gly Gly Gln Lys Lys Ala Thr Phe Arg Tyr His Phe Tyr Leu Asp Arg
 50 55 60

Met Pro Phe Tyr Ser Gln Ile Ser Val Tyr Phe Val Asn Gly Phe Arg
 65 70 75 80

Val Asn Gly Tyr Leu Cys Asn Asn Xaa
 85

<210> 179

<211> 197

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (197)

<223> Xaa equals stop translation

<400> 179

Met Ala Phe Arg Tyr Leu Ser Trp Ile Leu Phe Pro Leu Leu Gly Cys
 1 5 10 15

Tyr Ala Val Tyr Ser Leu Leu Tyr Leu Glu His Lys Gly Trp Tyr Ser
 20 25 30

Trp Val Leu Ser Met Leu Tyr Gly Phe Leu Leu Thr Phe Gly Phe Ile
 35 40 45

Thr Met Thr Pro Gln Leu Phe Ile Asn Tyr Lys Leu Lys Ser Val Ala
 50 55 60

His Leu Pro Trp Arg Met Leu Thr Tyr Lys Ala Leu Asn Thr Phe Ile
 65 70 75 80

Asp Asp Leu Phe Ala Phe Val Ile Lys Met Pro Val Met Tyr Arg Ile
 85 90 95

Gly Cys Leu Arg Asp Asp Val Val Phe Phe Ile Tyr Leu Tyr Gln Arg
 100 105 110

Trp Ile Tyr Arg Val Asp Pro Thr Arg Val Asn Glu Phe Gly Met Ser
 115 120 125

Gly Glu Asp Pro Thr Ala Ala Ala Pro Val Ala Glu Val Pro Thr Ala
 130 135 140

SUBSTITUTE SHEET (RULE 26)

105

Ala Gly Ala Leu Thr Pro Thr Pro Ala Pro Thr Thr Thr Thr Ala Thr
 145 150 155 160

Arg Glu Glu Ala Ser Thr Ser Leu Pro Thr Lys Pro Thr Gln Gly Ala
 165 170 175

Ser Ser Ala Ser Glu Pro Gln Glu Ala Pro Pro Lys Pro Ala Glu Asp
 180 185 190

Lys Lys Lys Asp Xaa
 195

<210> 180

<211> 129

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (129)

<223> Xaa equals stop translation

<400> 180

Met Tyr Glu Cys Phe Leu Ser Leu Ser Leu Leu Lys Ser Cys Lys Ala
 1 5 10 15

Val Ser Gly Leu Met Cys Leu Leu Leu Pro Arg Leu Gly Leu Leu Leu
 20 25 30

Leu Leu Pro Ser Glu Arg Cys Phe Cys Trp Ile Pro Val Tyr Ser Leu
 35 40 45

Ile Thr Cys Leu Ala Glu Cys Ser Val Val Leu Arg Asp Pro Gly Phe
 50 55 60

Ala Gly Ala Phe Gln Val His Arg Arg Gln Ala Cys Phe Ser Thr Leu
 65 70 75 80

Arg Trp Ser Cys Leu Leu Trp Trp Val Ser Arg Val Ser Ala Gly
 85 90 95

Arg Pro Leu Ile Gly Ser Pro His Met Met Ala Pro Ser Thr Phe Cys
 100 105 110

Pro Thr Val Arg Gly Pro Gly Thr Cys Ala Ser Ser Asp Pro Asp Gly
 115 120 125

Xaa

<210> 181

<211> 155

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (155)

<223> Xaa equals stop translation

<400> 181

```

Met Pro Ala Glu Lys Arg Ile Phe Gly Ala Val Leu Leu Phe Ser Trp
  1              5              10              15

Thr Val Tyr Leu Trp Glu Thr Phe Leu Ala Gln Arg Gln Arg Arg Ile
      20              25              30

Tyr Lys Thr Thr Thr His Val Pro Pro Glu Leu Gly Gln Ile Met Asp
      35              40              45

Ser Glu Thr Phe Glu Lys Ser Arg Leu Tyr Gln Leu Asp Lys Ser Thr
      50              55              60

Phe Ser Phe Trp Ser Gly Leu Tyr Ser Glu Thr Glu Gly Thr Leu Asn
  65              70              75              80

Leu Leu Phe Gly Gly Ile Pro Tyr Leu Trp Arg Leu Ser Gly Arg Phe
      85              90              95

Cys Gly Tyr Ala Gly Phe Gly Pro Glu Tyr Glu Ile Thr Gln Ser Leu
      100             105             110

Val Phe Leu Leu Leu Ala Thr Leu Phe Ser Ala Leu Thr Gly Val Pro
      115             120             125

Trp Ser Leu Tyr Asn Thr Phe Val Ile Lys Lys Thr Trp Leu Gln Ser
      130             135             140

Thr Asp Phe Gly Val Leu His Met Glu Ile Xaa
145              150              155

```

<210> 182

<211> 107

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (107)

<223> Xaa equals stop translation

<400> 182

```

Met Ser Leu Ser Trp Met Val His Leu Leu Gly Leu Pro Asn Gly Thr
  1              5              10              15

Val Trp Tyr Leu Pro Phe Val Cys Phe Thr Arg Gly Ser Pro Met Gly
      20              25              30

Gly Gly Ser Gly Gln Trp Arg Trp Asp Arg Lys Phe Ser Lys Thr Leu
      35              40              45

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SUBSTITUTE SHEET (RULE 26)

107

Leu Gly Asn Leu Phe Val Ala Phe Lys Glu Met Cys Gly Glu Asp Ile
 50 55 60

Trp Met Leu Ala Ala Ile Leu Glu Leu Arg Thr Gln Glu Trp Trp Lys
 65 70 75 80

Gly Arg Arg Asn Arg Val Phe Val Ala Val Val Lys Leu Leu Lys Phe
 85 90 95

Pro Ser Cys Gln Ala Ser Cys Tyr Met Arg Xaa
 100 105

<210> 183
 <211> 48
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (48)
 <223> Xaa equals stop translation

<400> 183
 Met Ile Asn Glu Trp Cys Phe Lys Leu Leu Ser Leu Trp Ser Phe Ala
 1 5 10 15

Tyr Ser Asn Cys Lys Leu Ile His Lys Cys Lys Phe Val Phe Leu Lys
 20 25 30

Lys Lys Lys Thr Gly Lys Glu Val Ser Val Lys Gly Ser Lys Leu Xaa
 35 40 45

<210> 184
 <211> 127
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (127)
 <223> Xaa equals stop translation

<400> 184
 Met Trp Leu Gly Ser Trp Leu Thr Ser Leu Leu Leu Ser Pro Tyr Gly
 1 5 10 15

Ser Gly Trp Glu Lys Val Pro Cys Cys Val Thr Gly His Leu Arg Ser
 20 25 30

Cys Ser Cys Cys Leu Leu Gly Leu Ala Gly Val Gln Ser Asp His Phe
 35 40 45

SUBSTITUTE SHEET (RULE 26)

108

Ser Glu Gly Phe Phe Ser Glu Tyr Ser Ser Asp Val Leu Pro Trp Gly
 50 55 60

Arg Arg Ser Phe Leu Pro Gln Gly Asp Ala Ser Leu Leu Ala Cys Glu
 65 70 75 80

Cys Phe Leu His Leu Gln Val Val Trp Gly Gln Phe Cys Leu Leu Glu
 85 90 95

Ala Trp Ala Gly Phe Thr Glu Gly Ser Met Pro Ala Pro Ser Cys Arg
 100 105 110

Val His Phe Trp Cys Arg Val Asn Thr Cys Pro Phe Met Ser Xaa
 115 120 125

<210> 185

<211> 87

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (87)

<223> Xaa equals stop translation

<400> 185

Met Leu Cys Gly Tyr Val Ile Asn Asn Ile Trp Leu Ile Phe Thr Tyr
 1 5 10 15

Phe Ile Cys Ile Tyr Ile Ser Arg Ser Tyr Ile Tyr Ile Thr Gln Glu
 20 25 30

Thr Gln Val Ile Tyr Ile Cys Gln Glu Met Tyr Asp Tyr Phe Gly Glu
 35 40 45

Asn Gly Pro Lys Cys Glu Lys Asp Ile Lys Lys Thr Lys Lys Thr Lys
 50 55 60

Lys Lys His Tyr Phe Pro Leu Arg Asn Ile Leu Tyr Ile Ser Lys Glu
 65 70 75 80

Glu Lys Leu Lys Asp Ile Xaa
 85

<210> 186

<211> 58

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (58)

<223> Xaa equals stop translation

<400> 186

SUBSTITUTE SHEET (RULE 26)

109

Met Ile Val Ser Tyr Arg Ile Val Ser Leu Pro Ser Ser Val Leu Cys
 1 5 10 15

Leu Phe Ile Pro Pro Phe Leu Leu Ile Phe Tyr Cys Leu His Ser Phe
 20 25 30

Val Phe Ser Gln Met Leu Tyr Ser Trp Asn Tyr His Val Thr Phe Gln
 35 40 45

Met Ala Phe Ser Leu Ile Ile Cys Val Xaa
 50 55

<210> 187

<211> 69

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (69)

<223> Xaa equals stop translation

<400> 187

Met Val Ala Ser Gln Ala Trp Trp Leu Ser Asn Leu Trp His Leu Trp
 1 5 10 15

Glu Val Gly Ser Ala Gln Gly Leu Pro Leu Asp Pro Pro Ala Leu Ala
 20 25 30

Pro Tyr Leu Pro Trp Ala Leu Arg Trp Pro Cys Phe Ser Gly Phe Ala
 35 40 45

Ser Leu Ala Gly Ala Leu Val Leu Ala His Ser Leu Pro Thr Ala Trp
 50 55 60

Pro Gly Ser Ser Xaa
 65

<210> 188

<211> 48

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (48)

<223> Xaa equals stop translation

<400> 188

Met Tyr Leu Phe Leu Leu Cys Cys Phe Ile Ser Glu His Cys Ala Gln
 1 5 10 15

His Ser Phe Pro His Thr Cys Pro Asn Trp Lys Thr Arg Val Leu Ser
 20 25 30

110

Phe Pro Leu His Pro Cys Pro His Leu Ile His Pro Asn Asn Thr Xaa
 35 40 45

<210> 189

<211> 51

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (5)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (51)

<223> Xaa equals stop translation

<400> 189

Met Leu Ser Ser Xaa Tyr Val Pro Met Cys Gln His Phe Ile Tyr Pro
 1 5 10 15

Val Leu Trp Val Leu Val His Phe Phe Ser Phe Ile Gln Ile Gln Lys
 20 25 30

Asn Thr Asp Gly Ser Asn Val Lys Leu Thr Arg Asn Pro Gly Thr Phe
 35 40 45

Ile Ser Xaa
 50

<210> 190

<211> 56

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (56)

<223> Xaa equals stop translation

<400> 190

Met Ala Val Arg Val Leu Trp Gly Gly Leu Ser Leu Leu Arg Val Leu
 1 5 10 15

Trp Cys Leu Leu Pro Gln Thr Gly Tyr Val His Pro Asp Glu Phe Phe
 20 25 30

Gln Ser Pro Glu Val Met Ala Gly Lys Thr Pro His Val Trp Leu Arg
 35 40 45

Gln Ala Ala Ala Glu Ser Ala Xaa

SUBSTITUTE SHEET (RULE 26)

50

55

<210> 191
 <211> 127
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (127)
 <223> Xaa equals stop translation

<400> 191
 Met Cys Ser Ser Phe Pro Arg Met Ala Leu Cys Ala Leu Trp Met Trp
 1 5 10 15
 Pro Ser Val Lys Ser Ser Val Pro Leu Pro Leu Arg Glu Pro Phe Leu
 20 25 30
 Trp Arg Ser Pro Gly Ser Gln Cys Leu Leu Cys Leu Gln Thr Ile His
 35 40 45
 Val Ser Cys Ser Glu Ala Cys Pro Leu Leu Glu Asn Ile Ser Lys Asn
 50 55 60
 Cys Thr Ile Pro Gln Arg Asp Leu Asp Asn Met Ala Phe Pro Gln Ala
 65 70 75 80
 Leu Pro Leu Glu Lys Arg Cys Glu Arg Phe Leu Gln Lys Ser Tyr Arg
 85 90 95
 Lys Leu Glu Lys Asn Pro Glu Lys Glu Glu Glu His Trp Ala Arg Leu
 100 105 110
 Gln Arg Tyr Ser Leu Ser Leu Gln Arg Glu Asn Phe Lys Lys Xaa
 115 120 125

<210> 192
 <211> 70
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (70)
 <223> Xaa equals stop translation

<400> 192
 Met Pro Phe Gln Leu Pro Leu Gln Leu Leu Leu Arg Leu Ile Cys
 1 5 10 15
 Glu Phe Phe Leu Ala Pro Ala Leu Asn Cys Asn Leu Thr Gly Thr Val
 20 25 30
 Ile Phe Phe Thr Leu Met Ile Ser Leu Gln Leu Met Ile Phe Phe Thr

SUBSTITUTE SHEET (RULE 26)

112

35

40

45

Leu Gln Phe Ala Asp Gly Phe Gln Ile Gly Val Asp Leu Gln Leu Ser
 50 55 60

Glu Leu Asn Ile Leu Xaa
 65 70

<210> 193

<211> 71

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (71)

<223> Xaa equals stop translation

<400> 193

Met Ile Ser Gly Val Leu Ile Phe Asn Leu Ile Ala Ser Ser Trp Val
 1 5 10 15

Leu Cys Phe Pro Leu Cys Asp Leu Ser Cys Gln Lys Thr Leu Arg Ile
 20 25 30

Phe Phe Ala Ser Phe Phe His Ala Val Cys Val His Val Ser Cys Thr
 35 40 45

Ser Trp Gln Pro Leu Val Leu Phe Ile Lys Trp Trp Val Val Gly Cys
 50 55 60

Ser Pro Ala Val Ser Leu Xaa
 65 70

<210> 194

<211> 130

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (130)

<223> Xaa equals stop translation

<400> 194

Met His Val Leu Pro Leu Leu Leu Ser Leu Leu Leu Leu Leu Leu
 1 5 10 15

Leu Ser Ala Ser Phe Val Thr Phe Ser Thr Pro Thr Ser Ser Arg Asn
 20 25 30

Ser Ser Cys Pro Asp Cys Glu Ser Leu Asn Thr Gly Leu Pro Ser Leu
 35 40 45

Met Met Phe Gly Gly Ser Leu Leu Lys Trp Val Gln Asn Thr His Gly

SUBSTITUTE SHEET (RULE 26)

113

50	55	60	
Val Glu Ser Leu Leu Ser Ser Ala Lys Val Arg Leu Leu Pro Pro Ala			
65	70	75	80
Leu Gly Val Leu Phe Pro Arg Leu His Pro Gly Thr Leu Thr Leu Val			
	85	90	95
Phe Leu Leu Ile Pro Phe Leu Thr Val Ser Ser Ser Thr Ser Asp Val			
	100	105	110
Leu Ser Ser Leu Glu Ser Pro Lys Leu Ser Val Thr Ile Phe His Tyr			
	115	120	125
Cys Xaa			
130			

<210> 195
 <211> 55
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (55)
 <223> Xaa equals stop translation

<400> 195
 Met Pro Trp Ile Leu Met Leu Leu Phe Thr Met Gly Gln Gly Val Val
 1 5 10 15
 Ile Leu Ala Phe Arg Ser Cys Leu Glu Ala Glu Val Arg Gly Val Pro
 20 25 30
 Gly Arg Gly Asn Arg Ser Gly Val Lys Thr Val Val Glu Ala Pro Ala
 35 40 45
 Val Phe Ala Lys Arg Pro Xaa
 50 55

<210> 196
 <211> 80
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (80)
 <223> Xaa equals stop translation

<400> 196
 Met Ala Ala Phe Phe Ala Leu Ala Ala Leu Val Gln Val Val Tyr Thr
 1 5 10 15
 Ile Pro Ala Val Leu Thr Leu Leu Val Gly Leu Asn Pro Glu Val Thr

SUBSTITUTE SHEET (RULE 26)

114

	20		25		30	
Gly	Asn	Val	Ile	Trp	Lys	Ser
	35		40		45	
Ile	Ser	Ala	Ile	His	Ile	Leu
						Phe
						Cys
Thr	Val	Trp	Ala	Val	Gly	Leu
	50		55		60	
Ala	Ser	Tyr	Leu	Leu	His	Arg
						Thr
						Gln
Gln	Asn	Ile	Leu	His	Glu	Glu
	65		70		75	
Gly	Arg	Ser	Cys	Leu	Val	Trp
						Xaa
						80

<210> 197
 <211> 42
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (42)
 <223> Xaa equals stop translation

<400> 197
Met Lys His Met Asn Thr Leu Pro Ile Phe Ser Ser Leu Ile Ser Phe
1 5 10 15
Leu Pro Ala Val Ser Ala Gly Arg Ser Ala Ile Thr Thr Leu Cys Asn
20 25 30
Ile Thr Glu Gln Leu Glu Val Leu Gly Xaa
35 40

<210> 198
 <211> 197
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (197)
 <223> Xaa equals stop translation

<400> 198
Met Lys Tyr Leu Arg His Arg Arg Pro Asn Ala Thr Leu Ile Leu Ala
1 5 10 15
Ile Gly Ala Phe Thr Leu Leu Leu Phe Ser Leu Leu Val Ser Pro Pro
20 25 30
Thr Cys Lys Val Gln Glu Gln Pro Pro Ala Ile Pro Glu Ala Leu Ala
35 40 45
Trp Pro Thr Pro Pro Thr Arg Pro Ala Pro Ala Pro Cys His Ala Asn

SUBSTITUTE SHEET (RULE 26)

115

50 55 60
 Thr Ser Met Val Thr His Pro Asp Phe Ala Thr Gln Pro Gln His Val
 65 70 75 80
 Gln Asn Phe Leu Leu Tyr Arg His Cys Arg His Phe Pro Leu Leu Gln
 85 90 95
 Asp Val Pro Pro Ser Lys Cys Ala Gln Pro Val Phe Leu Leu Leu Val
 100 105 110
 Ile Lys Ser Ser Pro Ser Asn Tyr Val Arg Arg Glu Leu Leu Arg Arg
 115 120 125
 Thr Trp Gly Arg Glu Arg Lys Val Arg Gly Leu Gln Leu Arg Leu Leu
 130 135 140
 Phe Leu Val Gly Thr Ala Ser Asn Pro His Glu Ala Arg Lys Val Asn
 145 150 155 160
 Arg Leu Leu Glu Leu Glu Ala Gln Thr His Gly Asp Ile Leu Gln Trp
 165 170 175
 Asp Phe His Asp Ser Phe Phe Asn Leu Thr Leu Lys Gln Val Arg Trp
 180 185 190
 Thr Gly Val Thr Xaa
 195

<210> 199

<211> 124

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (124)

<223> Xaa equals stop translation

<400> 199

Met Lys Leu Leu Leu Leu Ala Leu Pro Met Leu Val Leu Leu Pro Gln
 1 5 10 15
 Val Ile Pro Ala Tyr Ser Gly Glu Lys Lys Cys Trp Asn Arg Ser Gly
 20 25 30
 His Cys Arg Lys Gln Cys Lys Asp Gly Glu Ala Val Lys Asp Thr Cys
 35 40 45
 Lys Asn Leu Arg Ala Cys Cys Ile Pro Ser Asn Glu Asp His Arg Arg
 50 55 60
 Val Pro Ala Thr Ser Pro Thr Pro Leu Ser Asp Ser Thr Pro Gly Ile
 65 70 75 80
 Ile Asp Asp Ile Leu Thr Val Arg Phe Thr Thr Asp Tyr Phe Glu Val

SUBSTITUTE SHEET (RULE 26)

116

85 90 95

Ser Ser Lys Lys Asp Met Val Glu Glu Ser Glu Ala Gly Arg Gly Thr
 100 105 110

Glu Thr Ser Leu Pro Asn Val His His Ser Ser Xaa
 115 120

<210> 200
 <211> 549
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (132)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (398)
 <223> Xaa equals any of the naturally occurring L-amino acids

<400> 200
 Met Gly Asn Ala Cys Ile Pro Leu Lys Arg Ile Ala Tyr Phe Leu Cys
 1 5 10 15

Leu Leu Ser Ala Leu Leu Leu Thr Glu Gly Lys Lys Pro Ala Lys Pro
 20 25 30

Lys Cys Pro Ala Val Cys Thr Cys Thr Lys Asp Asn Ala Leu Cys Glu
 35 40 45

Asn Ala Arg Ser Ile Pro Arg Thr Val Pro Pro Asp Val Ile Ser Leu
 50 55 60

Ser Phe Val Arg Ser Gly Phe Thr Glu Ile Ser Glu Gly Ser Phe Leu
 65 70 75 80

Phe Thr Pro Ser Leu Gln Leu Leu Leu Phe Thr Ser Asn Ser Phe Asp
 85 90 95

Val Ile Ser Asp Asp Ala Phe Ile Gly Leu Pro His Leu Glu Tyr Leu
 100 105 110

Phe Ile Glu Asn Asn Asn Ile Lys Ser Ile Ser Arg His Thr Phe Arg
 115 120 125

Gly Leu Lys Xaa Leu Ile His Leu Ser Leu Ala Asn Asn Asn Leu Gln
 130 135 140

Thr Leu Pro Lys Asp Ile Phe Lys Gly Leu Asp Ser Leu Thr Asn Val
 145 150 155 160

Asp Leu Arg Gly Asn Ser Phe Asn Cys Asp Cys Lys Leu Lys Trp Leu
 165 170 175

SUBSTITUTE SHEET (RULE 26)

Val	Glu	Trp	Leu	Gly	His	Thr	Asn	Ala	Thr	Val	Glu	Asp	Ile	Tyr	Cys	
			180					185					190			
Glu	Gly	Pro	Pro	Glu	Tyr	Lys	Lys	Arg	Lys	Ile	Asn	Ser	Leu	Ser	Ser	
		195					200					205				
Lys	Asp	Phe	Asp	Cys	Ile	Ile	Thr	Glu	Phe	Ala	Lys	Ser	Gln	Asp	Leu	
	210					215					220					
Pro	Tyr	Gln	Ser	Leu	Ser	Ile	Asp	Thr	Phe	Ser	Tyr	Leu	Asn	Asp	Glu	
225					230					235					240	
Tyr	Val	Val	Ile	Ala	Gln	Pro	Phe	Thr	Gly	Lys	Cys	Ile	Phe	Leu	Glu	
				245					250					255		
Trp	Asp	His	Val	Glu	Lys	Thr	Phe	Arg	Asn	Tyr	Asp	Asn	Ile	Thr	Gly	
			260					265					270			
Thr	Ser	Thr	Val	Val	Cys	Lys	Pro	Ile	Val	Ile	Glu	Thr	Gln	Leu	Tyr	
			275				280						285			
Val	Ile	Val	Ala	Gln	Leu	Phe	Gly	Gly	Ser	His	Ile	Tyr	Lys	Arg	Asp	
	290					295					300					
Ser	Phe	Ala	Asn	Lys	Phe	Ile	Lys	Ile	Gln	Asp	Ile	Glu	Ile	Leu	Lys	
305					310					315					320	
Ile	Arg	Lys	Pro	Asn	Asp	Ile	Glu	Thr	Phe	Lys	Ile	Glu	Asn	Asn	Trp	
			325						330					335		
Tyr	Phe	Val	Val	Ala	Asp	Ser	Ser	Lys	Ala	Gly	Phe	Thr	Thr	Ile	Tyr	
			340					345						350		
Lys	Trp	Asn	Gly	Asn	Gly	Phe	Tyr	Ser	His	Gln	Ser	Leu	His	Ala	Trp	
		355					360					365				
Tyr	Arg	Asp	Thr	Asp	Val	Glu	Tyr	Leu	Glu	Ile	Val	Arg	Thr	Pro	Gln	
	370					375					380					
Thr	Leu	Arg	Thr	Pro	His	Leu	Ile	Leu	Ser	Ser	Ser	Ser	Xaa	Arg	Pro	
385					390					395					400	
Val	Ile	Tyr	Gln	Trp	Asn	Lys	Ala	Thr	Gln	Leu	Phe	Thr	Asn	Gln	Thr	
			405						410					415		
Asp	Ile	Pro	Asn	Met	Glu	Asp	Val	Tyr	Ala	Val	Lys	His	Phe	Ser	Val	
			420					425					430			
Lys	Gly	Asp	Val	Tyr	Ile	Cys	Leu	Thr	Arg	Phe	Ile	Gly	Asp	Ser	Lys	
		435					440					445				
Val	Met	Lys	Trp	Gly	Gly	Ser	Ser	Phe	Gln	Asp	Ile	Gln	Arg	Met	Pro	
	450					455					460					
Ser	Arg	Gly	Ser	Met	Val	Phe	Gln	Pro	Leu	Gln	Ile	Asn	Asn	Tyr	Gln	
465					470					475					480	

SUBSTITUTE SHEET (RULE 26)

Tyr Ala Ile Leu Gly Ser Asp Tyr Ser Phe Thr Gln Val Tyr Asn Trp
 485 490 495
 Asp Ala Glu Lys Ala Lys Phe Val Lys Phe Gln Glu Leu Asn Val Gln
 500 505 510
 Ala Pro Arg Ser Phe Thr His Val Ser Ile Asn Lys Arg Asn Phe Leu
 515 520 525
 Phe Ala Ser Ser Phe Lys Gly Asn Thr Gln Ile Tyr Lys His Val Ile
 530 535 540
 Val Asp Leu Ser Ala
 545

<210> 201

<211> 488

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (344)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (416)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (429)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (430)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 201

Met Ile Leu Ser Leu Leu Phe Ser Leu Gly Gly Pro Leu Gly Trp Gly
 1 5 10 15
 Leu Leu Gly Ala Trp Ala Gln Ala Ser Ser Thr Ser Leu Ser Asp Leu
 20 25 30
 Gln Ser Ser Arg Thr Pro Gly Val Trp Lys Ala Glu Ala Glu Asp Thr
 35 40 45
 Ser Lys Asp Pro Val Gly Arg Asn Trp Cys Pro Tyr Pro Met Ser Lys
 50 55 60
 Leu Val Thr Leu Leu Ala Leu Cys Lys Thr Glu Lys Phe Leu Ile His
 65 70 75 80

SUBSTITUTE SHEET (RULE 26)

Ser Gln Gln Pro Cys Pro Gln Gly Ala Pro Asp Cys Gln Lys Val Lys
 85 90 95
 Val Met Tyr Arg Met Ala His Lys Pro Val Tyr Gln Val Lys Gln Lys
 100 105 110
 Val Leu Thr Ser Leu Ala Trp Arg Cys Cys Pro Gly Tyr Thr Gly Pro
 115 120 125
 Asn Cys Glu His His Asp Ser Met Ala Ile Pro Glu Pro Ala Asp Pro
 130 135 140
 Gly Asp Ser His Gln Glu Pro Gln Asp Gly Pro Val Ser Phe Lys Pro
 145 150 155 160
 Gly His Leu Ala Ala Val Ile Asn Glu Val Glu Val Gln Gln Glu Gln
 165 170 175
 Gln Glu His Leu Leu Gly Asp Leu Gln Asn Asp Val His Arg Val Ala
 180 185 190
 Asp Ser Leu Pro Gly Leu Trp Lys Ala Leu Pro Gly Asn Leu Thr Ala
 195 200 205
 Ala Val Met Glu Ala Asn Gln Thr Gly His Glu Phe Pro Asp Arg Ser
 210 215 220
 Leu Glu Gln Val Leu Leu Pro His Val Asp Thr Phe Leu Gln Val His
 225 230 235 240
 Phe Ser Pro Ile Trp Arg Ser Phe Asn Gln Ser Leu His Ser Leu Thr
 245 250 255
 Gln Ala Ile Arg Asn Leu Ser Leu Asp Val Glu Ala Asn Arg Gln Ala
 260 265 270
 Ile Ser Arg Val Gln Asp Ser Ala Val Ala Arg Ala Asp Phe Gln Glu
 275 280 285
 Leu Gly Ala Lys Phe Glu Ala Lys Val Gln Glu Asn Thr Gln Arg Val
 290 295 300
 Gly Gln Leu Arg Gln Asp Val Glu Glu Arg Leu His Ala Gln His Phe
 305 310 315 320
 Thr Leu His Arg Ser Ile Ser Glu Leu Gln Ala Asp Val Asp Thr Lys
 325 330 335
 Leu Lys Arg Leu His Lys Ala Xaa Glu Ala Pro Gly Thr Asn Gly Ser
 340 345 350
 Leu Val Leu Ala Thr Pro Gly Ala Gly Ala Arg Pro Glu Pro Asp Ser
 355 360 365
 Leu Gln Ala Arg Leu Gly Gln Leu Gln Arg Asn Leu Ser Glu Leu His
 370 375 380

120

Met Thr Thr Ala Arg Arg Glu Glu Glu Leu Gln Tyr Thr Leu Glu Asp
385 390 395 400

Met Arg Ala Thr Leu Thr Arg His Val Asp Glu Ile Lys Glu Leu Xaa
405 410 415

Ser Glu Ser Asp Glu Thr Phe Asp Gln Ile Ser Lys Xaa Xaa Arg Gln
420 425 430

Val Glu Glu Leu Gln Val Asn His Thr Ala Leu Arg Glu Leu Arg Val
435 440 445

Ile Leu Met Glu Lys Ser Leu Ile Met Glu Glu Asn Lys Glu Glu Val
450 455 460

Glu Arg Gln Leu Leu Glu Leu Asn Leu Thr Leu Gln His Leu Gln Gly
465 470 475 480

Gly Met Pro Thr Ser Ser Ser Thr
485

<210> 202

<211> 86

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (86)

<223> Xaa equals stop translation

<400> 202

Met Ala His Gly Pro Gln Ser Leu Trp Ser Leu Gly Phe Thr Val Thr
1 5 10 15

Leu Thr Phe Glu Leu Pro Val Gly Cys Val Leu Gly Arg Ile Cys His
20 25 30

Pro Ile Gln Ala Cys Asn Thr Gly Leu Met Thr Pro Thr Pro Gln Gly
35 40 45

Pro Cys Arg Thr Glu Met Met Ser Asn Asp Lys Pro Trp Leu Pro Ala
50 55 60

Asn Ala Pro Ala His Ile Ser Leu Pro Gly Ala Arg Leu Thr Ser Thr
65 70 75 80

Cys Ala Pro Gly Leu Xaa
85

<210> 203

<211> 400

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (400)

<223> Xaa equals stop translation

<400> 203

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Met Ala Ile His Lys Ala Leu Val Met Cys Leu Gly Leu Pro Leu Phe
  1             5             10             15

Leu Phe Pro Gly Ala Trp Ala Gln Gly His Val Pro Pro Gly Cys Ser
          20             25             30

Gln Gly Leu Asn Pro Leu Tyr Tyr Asn Leu Cys Asp Arg Ser Gly Ala
          35             40             45

Trp Gly Ile Val Leu Glu Ala Val Ala Gly Ala Gly Ile Val Thr Thr
          50             55             60

Phe Val Leu Thr Ile Ile Leu Val Ala Ser Leu Pro Phe Val Gln Asp
          65             70             75             80

Thr Lys Lys Arg Ser Leu Leu Gly Thr Gln Val Phe Phe Leu Leu Gly
          85             90             95

Thr Leu Gly Leu Phe Cys Leu Val Phe Ala Cys Val Val Lys Pro Asp
          100            105            110

Phe Ser Thr Cys Ala Ser Arg Arg Phe Leu Phe Gly Val Leu Phe Ala
          115            120            125

Ile Cys Phe Ser Cys Leu Ala Ala His Val Phe Ala Leu Asn Phe Leu
          130            135            140

Ala Arg Lys Asn His Gly Pro Arg Gly Trp Val Ile Phe Thr Val Ala
          145            150            155            160

Leu Leu Leu Thr Leu Val Glu Val Ile Ile Asn Thr Glu Trp Leu Ile
          165            170            175

Ile Thr Leu Val Arg Gly Ser Gly Glu Gly Gly Pro Gln Gly Asn Ser
          180            185            190

Ser Ala Gly Trp Ala Val Ala Ser Pro Cys Ala Ile Ala Asn Met Asp
          195            200            205

Phe Val Met Ala Leu Ile Tyr Val Met Leu Leu Leu Leu Gly Ala Phe
          210            215            220

Leu Gly Ala Trp Pro Ala Leu Cys Gly Arg Tyr Lys Arg Trp Arg Lys
          225            230            235            240

His Gly Val Phe Val Leu Leu Thr Thr Ala Thr Ser Val Ala Ile Trp
          245            250            255

Val Val Trp Ile Val Met Tyr Thr Tyr Gly Asn Lys Gln His Asn Ser
          260            265            270

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SUBSTITUTE SHEET (RULE 26)

<400> 167

Met Thr Lys Ala Arg Leu Phe Arg Leu Trp Leu Val Leu Gly Ser Val
 1 5 10 15

Phe Met Ile Leu Leu Ile Ile Val Tyr Trp Asp Ser Ala Ala Pro Arg
 20 25 30

Thr Ser Thr Cys Thr Arg Pro Ser Leu Gly Arg Thr Arg Gly Arg Arg
 35 40 45

Cys Pro Arg Pro Gly Arg Thr Gly Gln Gly Ala His Gly Arg Leu Arg
 50 55 60

Cys Arg Arg Val Ser Gly Gln Phe Leu Met Leu Ala Xaa
 65 70 75

<210> 168

<211> 355

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (355)

<223> Xaa equals stop translation

<400> 168

Met Trp Arg Leu Trp Pro Gly Ser Pro Leu Val Pro Leu Ser Trp Leu
 1 5 10 15

Trp Pro Ala Arg Ala Ala Phe Leu Ser Gly Pro Trp Thr Leu Pro Pro
 20 25 30

Cys Leu Pro Asp Pro Leu Leu Ala Val Pro Lys Cys Cys Leu Thr Leu
 35 40 45

Gly Ile His Leu Leu Pro Ala Trp Pro Gly Pro Pro Val Gly Gly Gly
 50 55 60

Cys Ser Gln Leu His Arg Gly Cys Cys Tyr Pro Gly Met Gly Cys Leu
 65 70 75 80

Asn Arg Asp Leu Cys Pro Pro Ser Leu Val Ser Arg Arg Trp Gly Asp
 85 90 95

Gln Leu Leu Trp Ser Pro Asp Gly Ser Lys Ile Leu Ala Thr Thr Pro
 100 105 110

Ser Ala Val Phe Arg Val Trp Glu Ala Gln Met Trp Thr Cys Glu Arg
 115 120 125

Trp Pro Thr Leu Ser Gly Arg Cys Gln Thr Gly Cys Trp Ser Pro Asp
 130 135 140

Gly Ser Arg Leu Leu Phe Thr Val Leu Gly Glu Pro Leu Ile Tyr Ser

SUBSTITUTE SHEET (RULE 26)

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<220>  
<221> SITE  
<222> (77)  
<223> Xaa equals stop translation
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BNSDOCID: <WO 9931117A1 | >

95

20

25

30

Gly Lys Ala Trp Ser Ala Thr Arg Ser Pro Ser Asp Ser Cys Phe Pro
 35 40 45

Gly Val Ala Arg Val Gly Ile Xaa
 50 55

<210> 164

<211> 48

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (48)

<223> Xaa equals stop translation

<400> 164

Met His Gly His Thr Ser Ser Leu Pro Pro Ser Leu Leu Ser Ser Leu
 1 5 10 15

Pro Ser Gly Leu Leu Ala Leu Phe Val Phe Pro Phe Leu Ile Leu Leu
 20 25 30

Leu His Ala Glu Asp Leu Pro Tyr Tyr Phe Gly Asn Ile Glu Xaa
 35 40 45

<210> 165

<211> 130

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (130)

<223> Xaa equals stop translation

<400> 165

Met Ser Ala Ser Ser Leu His Arg Leu Pro Val Leu Met Ala Leu Phe
 1 5 10 15

Pro Phe Gln Ala Ala Ala Ala Gly Ser Leu Gly Leu Gln Pro Pro Pro
 20 25 30

Thr Pro Met Lys Gly Lys Pro Ser Ile Met Leu Pro Pro Gln Tyr Lys
 35 40 45

Arg Arg Glu Gly Leu Lys Lys Lys Lys Lys Ile Gln Lys Val Ala
 50 55 60

Leu Val Ser Phe Gly Arg Ala Asp Ser Ile Val Gly Asp Gly Leu Pro

SUBSTITUTE SHEET (RULE 26)

<221> SITE
 <222> (53)
 <223> Xaa equals stop translation

<400> 161

Met Leu Tyr Asp Ser Asn Leu Cys Ser Val Trp His Leu Tyr Leu Ile
 1 5 10 15

Leu His Leu Cys Lys Thr Phe Val Tyr Cys Gly Cys Val His Ser Ser
 20 25 30

Tyr Leu Ile Ser Gly Thr Val Asn Thr Gln Tyr Phe Ile Val Gln Thr
 35 40 45

Val Leu Leu Phe Xaa
 50

<210> 162
 <211> 57
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (57)
 <223> Xaa equals stop translation

<400> 162

Met Arg Val Lys Ile Ser Tyr Leu Met Ile Ala Leu Thr Val Val Gly
 1 5 10 15

Cys Ile Phe Met Val Ile Glu Gly Lys Lys Ala Ala Gln Arg His Glu
 20 25 30

Thr Leu Thr Ser Leu Asn Leu Glu Lys Lys Ala Arg Leu Lys Glu Glu
 35 40 45

Ala Ala Met Lys Ala Lys Thr Glu Xaa
 50 55

<210> 163
 <211> 56
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (56)
 <223> Xaa equals stop translation

<400> 163

Met Arg Glu Lys Thr Gly Ala Leu Pro Arg Cys Leu Gly Leu Leu Gly
 1 5 10 15

Val Gly Leu Leu Trp Arg Trp Cys Gly Arg Arg Ala Arg Ala Gly Val

SUBSTITUTE SHEET (RULE 26)

85

<210> 159
 <211> 45
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (45)
 <223> Xaa equals stop translation

<400> 159
 Met Ile Cys Leu Cys Ser Ile Lys Met Leu Leu Leu Phe Cys Gln Leu
 1 5 10 15
 Thr Phe Ala Leu Ile Thr Cys Ile Asn Leu Gln Ser Leu Tyr Leu Phe
 20 25 30
 Ser Tyr Gln Gln Ile Ile Gly Ile His Ser His Val Xaa
 35 40 45

<210> 160
 <211> 69
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (69)
 <223> Xaa equals stop translation

<400> 160
 Met Trp Leu Arg Gly Ile His Pro Phe Leu Trp Leu Ser Gly Ile His
 1 5 10 15
 Ser Phe Pro Trp Leu Ser Gly Gly Pro Ser Leu Gly Thr Ser Ser Glu
 20 25 30
 Gln Pro Thr Ser Leu Glu Asp Gly Lys Leu Ile Cys Leu Phe Thr Asp
 35 40 45
 Phe Ser Gly Ser Ser Phe Gly Leu Phe Met Arg Glu Ala Ala Lys Asn
 50 55 60
 Ile Ser Gln Met Xaa
 65

<210> 161
 <211> 53
 <212> PRT
 <213> Homo sapiens

<220>

92

20

25

30

Asp Val Pro Ile Phe Ala Cys Leu Ala Leu Ala Ser Leu Ala Leu Gly
 35 40 45

Ser Val Leu Leu Val Ala Phe Xaa
 50 55

<210> 157

<211> 45

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (45)

<223> Xaa equals stop translation

<400> 157

Met Met Lys Met Val Leu Gly Leu Phe Phe Leu Met Asn Leu Leu Ser
 1 5 10 15

Gly Lys Lys Ser Val Arg His His Ser Lys Asn Tyr Val Lys Lys Met
 20 25 30

Gln Thr Phe Gln Phe Pro Arg Val Tyr Lys Leu Met Xaa
 35 40 45

<210> 158

<211> 86

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (86)

<223> Xaa equals stop translation

<400> 158

Met Lys Lys Val Leu Leu Leu Ile Thr Ala Ile Leu Ala Val Ala Val
 1 5 10 15

Gly Phe Pro Val Ser Gln Asp Gln Glu Arg Glu Lys Arg Ser Ile Ser
 20 25 30

Asp Ser Asp Glu Leu Ala Ser Gly Phe Phe Val Phe Pro Tyr Pro Tyr
 35 40 45

Pro Phe Arg Pro Leu Pro Pro Ile Pro Phe Pro Arg Phe Pro Trp Phe
 50 55 60

Arg Arg Asn Phe Pro Ile Pro Ile Pro Glu Ser Ala Pro Thr Thr Pro
 65 70 75 80

Leu Pro Ser Glu Lys Xaa

SUBSTITUTE SHEET (RULE 26)

Ala Phe Ser Pro Ser Ala Val Arg Asp His Val Gly Asp Ser Arg Ser

<210> 152
 <211> 42
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (42)
 <223> Xaa equals stop translation

<400> 152
 Met Leu His Leu Leu Cys Leu Gly Leu His Leu Val Pro Pro Gly Leu
 1 5 10 15

Leu Ser Val Asn Ser Leu Gln Ser Thr Gln Cys Ser Leu Phe Ser Ala
 20 25 30

Ala Lys Phe Phe Ser Ile Val Gln Val Xaa
 35 40

<210> 153
 <211> 44
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (44)
 <223> Xaa equals stop translation

<400> 153
 Met Pro Tyr Met Phe Arg Pro Ala Phe Leu Asn Cys Gly Thr Phe Ala
 1 5 10 15

Ile Phe Gly Gln Leu Asn Ser Val Val Gly Ala Val Leu Cys Ile Ala
 20 25 30

Gly Cys Leu Ala Ala Ser Leu Ala Ser Thr Tyr Xaa
 35 40

<210> 154
 <211> 123
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (123)
 <223> Xaa equals stop translation

<400> 154
 Met Pro Pro Leu Ala Pro Gln Leu Cys Arg Ala Val Phe Leu Val Pro
 1 5 10 15

Ile Leu Leu Leu Leu Gln Val Lys Pro Leu Asn Gly Ser Pro Gly Pro

SUBSTITUTE SHEET (RULE 26)

Pro Thr Trp Asp Asp Pro Thr Leu Ala Ile Ala Leu Ala Ala Asn Ala
 275 280 285

Trp Ala Phe Val Leu Phe Tyr Val Ile Pro Glu Val Ser Gln Val Thr
 290 295 300

Lys Ser Ser Pro Glu Gln Ser Tyr Gln Gly Asp Met Tyr Pro Thr Arg
 305 310 315 320

Gly Val Gly Tyr Glu Thr Ile Leu Lys Glu Gln Lys Gly Gln Ser Met
 325 330 335

Phe Val Glu Asn Lys Ala Phe Ser Met Asp Glu Pro Val Ala Ala Lys
 340 345 350

Arg Pro Val Ser Pro Tyr Ser Gly Tyr Asn Gly Gln Leu Leu Thr Ser
 355 360 365

Val Tyr Gln Pro Thr Glu Met Ala Leu Met His Lys Val Pro Ser Glu
 370 375 380

Glu Leu Thr Thr Ser Ser Ser His Gly Pro Pro Pro Thr Ala Arg Xaa
 385 390 395 400

<210> 204

<211> 195

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (195)

<223> Xaa equals stop translation

<400> 204

Met Ser Thr Ala Phe Cys Pro Ile His Ser Ser Leu Gly Ser Met Val
 1 5 10 15

Met Cys Leu Cys Ile Leu Ser Pro Leu Cys Ile Ala Ser Lys Ser Leu
 20 25 30

Arg Val Cys Thr Lys Ser Tyr Met Glu Gly His Gly Lys Thr Arg Val
 35 40 45

Pro Val Val Leu Val Gly Asn Lys Ala Asp Leu Ser Pro Glu Arg Glu
 50 55 60

Val Gln Ala Val Glu Gly Lys Lys Leu Ala Glu Ser Trp Gly Ala Thr
 65 70 75 80

Phe Met Glu Ser Ser Ala Arg Glu Asn Gln Leu Thr Gln Gly Ile Phe
 85 90 95

SUBSTITUTE SHEET (RULE 26)

Thr Lys Val Ile Gln Glu Ile Ala Arg Val Gly Glu Phe Leu Trp Ala
 100 105 110
 Arg Ala Ser Leu Pro Ser His Val Ser Pro Trp Val Trp Gly Asn Cys
 115 120 125
 Leu Ala Ser Ala Pro Gly Thr Cys His Val Pro Val Gly Gly Arg Ser
 130 135 140
 Ser Gly Leu His Gly Tyr Gly Cys Gln Leu Cys Ser Trp Pro Leu Asp
 145 150 155 160
 Thr Gln Cys Gly Ile Leu Met Phe Ala His Phe Pro Gln Ala Pro Val
 165 170 175
 Ala Trp Met Ser Met Phe Thr Lys Gly Gln Gly Pro Leu Met Asp Thr
 180 185 190
 Gly Leu Xaa
 195

<210> 205
 <211> 57
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (57)
 <223> Xaa equals stop translation

<400> 205
 Met Pro Leu Glu Glu Ser Phe Glu Ile Val Leu Lys Leu Val Pro Leu
 1 5 10 15
 Leu Gly Leu Glu Leu Phe Phe Phe Leu Phe Ile Ile Asn Gly Tyr Ile
 20 25 30
 Asn Val Tyr Cys Pro Ser Gln Tyr Phe Ile Tyr Ala Lys Asp Ser Leu
 35 40 45
 Ala Gly Leu Ala Leu Ile Pro Gln Xaa
 50 55

<210> 206
 <211> 73
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (73)
 <223> Xaa equals stop translation

124

<400> 206

Met Ile Val Ile Tyr Leu Thr Leu Thr Trp Thr Phe Leu Ile Asn Leu
 1 5 10 15

Leu Ala Cys Pro Leu Tyr His Leu Pro Gln Met Gln Lys Lys Ala Lys
 20 25 30

Pro Glu Thr Lys Lys Ala Lys Pro Glu Thr Lys Glu Thr Ile Gln Arg
 35 40 45

Gln Arg Asn Leu Phe Leu Val Leu Leu Lys Gln Leu Ala Gly Lys Lys
 50 55 60

Cys Ser Ala Leu Phe Leu Ile Val Xaa
 65 70

<210> 207

<211> 85

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (85)

<223> Xaa equals stop translation

<400> 207

Met Val Trp Cys Gln Cys Leu Cys Pro Leu Cys Ala Cys Trp Glu Glu
 1 5 10 15

Ala Gln Ala Leu Trp Trp Pro Pro Leu Cys Thr Trp Pro Gly Glu Ala
 20 25 30

Arg Gly Ser Gly Ala Ser Leu Arg Leu Arg Pro Pro Leu Gln Asn Lys
 35 40 45

Leu Ser Pro Gly Val Cys Leu Ser Leu Phe Leu Ser Pro Glu Arg Asn
 50 55 60

Ala Gly Val Pro Glu Ala Ser Leu Gln Thr Lys His Pro Cys Thr Ser
 65 70 75 80

Tyr Gly Ser Gly Xaa
 85

<210> 208

<211> 195

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (195)

<223> Xaa equals stop translation

SUBSTITUTE SHEET (RULE 26)

125

<400> 208

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Met Trp Val Ser Leu Tyr Phe Gly Ile Leu Gly Leu Cys Ser Val Ile
 1              5              10              15

Thr Gly Gly Cys Ile Ile Phe Leu His Trp Arg Lys Asn Leu Arg Arg
      20              25              30

Glu Glu His Ala Gln Gln Trp Val Glu Val Met Arg Ala Ala Thr Phe
      35              40              45

Thr Tyr Ser Pro Leu Leu Tyr Trp Ile Asn Lys Arg Arg Arg Tyr Gly
      50              55              60

Met Asn Ala Ala Ile Asn Thr Gly Pro Ala Pro Ala Val Thr Lys Thr
      65              70              75              80

Glu Thr Glu Val Gln Asn Pro Asp Val Leu Trp Asp Leu Asp Ile Pro
      85              90              95

Glu Gly Arg Ser His Ala Asp Gln Asp Ser Asn Pro Lys Ala Glu Ala
      100              105              110

Pro Ala Pro Leu Gln Pro Ala Leu Gln Leu Ala Pro Gln Gln Pro Gln
      115              120              125

Ala Arg Ser Pro Phe Pro Leu Pro Ile Phe Gln Glu Val Pro Phe Ala
      130              135              140

Pro Pro Leu Cys Asn Leu Pro Pro Leu Leu Asn His Ser Val Ser Tyr
      145              150              155              160

Pro Leu Ala Thr Cys Pro Glu Arg Asn Val Leu Phe His Ser Leu Leu
      165              170              175

Asn Leu Ala Gln Glu Asp His Ser Phe Asn Ala Lys Pro Phe Pro Ser
      180              185              190

Glu Leu Xaa
      195

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<210> 209

<211> 42

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (42)

<223> Xaa equals stop translation

<400> 209

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Met Leu Gln Arg Gly Gln His Leu Tyr Leu Val Val Phe Leu Met Val
 1              5              10              15

Ser Phe Ile Pro Leu Leu Asn Pro Lys Gln Asp Leu Lys Lys Leu Lys
      20              25              30

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SUBSTITUTE SHEET (RULE 26)

Lys Asn Arg Thr Val Arg Asn His Phe Xaa
 35 40

<210> 210

<211> 282

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (282)

<223> Xaa equals stop translation

<400> 210

Met Ser Ile Leu Thr Met Ile Ser Ser Trp Pro Phe Ser Arg Val Val
 1 5 10 15

Arg Phe Trp Phe Leu His Gln Met Val Leu Asp Leu Cys Leu Gly Gln
 20 25 30

Gly Val Pro Gln Gln Asn Leu Gly Lys Pro Lys Gly Lys Lys Lys Leu
 35 40 45

Ser Ser Val Arg Gln Lys Phe Asp His Arg Phe Gln Pro Gln Asn Pro
 50 55 60

Leu Ser Gly Ala Gln Gln Phe Val Ala Lys Asp Pro Gln Asp Asp Asp
 65 70 75 80

Asp Leu Lys Leu Cys Ser His Thr Met Met Leu Pro Thr Arg Gly Gln
 85 90 95

Leu Glu Gly Arg Met Ile Val Thr Ala Tyr Glu His Gly Leu Asp Asn
 100 105 110

Val Thr Glu Glu Ala Val Ser Ala Val Val Tyr Ala Val Glu Asn His
 115 120 125

Leu Lys Asp Ile Leu Thr Ser Val Val Ser Arg Arg Lys Ala Tyr Arg
 130 135 140

Leu Arg Asp Gly His Phe Lys Tyr Ala Phe Gly Ser Asn Val Thr Pro
 145 150 155 160

Gln Pro Tyr Leu Lys Asn Ser Val Val Ala Tyr Asn Asn Leu Ile Glu
 165 170 175

Ser Pro Pro Ala Phe Thr Ala Pro Cys Ala Gly Gln Asn Pro Ala Ser
 180 185 190

His Pro Pro Pro Asp Asp Ala Glu Gln Gln Ala Ala Leu Leu Leu Ala
 195 200 205

Cys Ser Gly Asp Thr Leu Pro Ala Ser Leu Pro Pro Val Asn Met Tyr
 210 215 220

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127

Asp Leu Phe Glu Ala Leu Gln Val His Arg Glu Val Ile Pro Thr His
 225 230 235 240

Thr Val Tyr Ala Leu Asn Ile Glu Arg Ile Ile Thr Lys Leu Trp His
 245 250 255

Pro Asn His Glu Glu Leu Gln Gln Asp Lys Val His Arg Gln Arg Leu
 260 265 270

Ala Ala Lys Glu Gly Leu Leu Leu Cys Xaa
 275 280

<210> 211

<211> 48

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (48)

<223> Xaa equals stop translation

<400> 211

Met Pro Lys Thr Cys Leu Pro Ile Leu Cys Leu Pro Leu Thr Gln Ala
 1 5 10 15

Val Val Leu Ala Gln Leu Asn Asn Phe Ser Ser Leu Asn Ile Phe Ile
 20 25 30

Phe Lys Ile Lys Asn Lys Met Tyr Tyr Ile Trp Ile Tyr Asp Lys Xaa
 35 40 45

<210> 212

<211> 59

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (59)

<223> Xaa equals stop translation

<400> 212

Met Trp Pro Cys Cys Leu Asp Ser Leu Leu Phe Gly Phe Trp Leu Trp
 1 5 10 15

Ala Gln Gly Ile Thr Leu Leu Ser Glu Asp Ser Ile Arg Ile Val Cys
 20 25 30

Ser Ser Cys Glu Pro Glu Val Leu His Val Pro Thr Pro Val Tyr Arg
 35 40 45

SUBSTITUTE SHEET (RULE 26)

Pro Cys Pro Ser His Ser Pro Leu Thr Phe Xaa
 50 55

<210> 213
 <211> 43
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (43)
 <223> Xaa equals stop translation

<400> 213
 Met Ala Leu Gln Ser Ile Pro Ser Phe Thr Leu Leu Ile Ser Phe Phe
 1 5 10 15
 Leu Ser Thr Gln Cys Leu Arg Cys Val Tyr Asn Tyr Glu Cys Ile Leu
 20 25 30

Phe Met Ala Phe Asn Cys Arg Met Val Phe Xaa
 35 40

<210> 214
 <211> 53
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (53)
 <223> Xaa equals stop translation

<400> 214
 Met Pro Ala Val Ser Ala Phe Phe Ser Leu Ala Ala Leu Ala Glu Val
 1 5 10 15
 Ala Ala Met Glu Asn Val His Arg Gly Gln Arg Ser Thr Pro Leu Thr
 20 25 30

His Asp Gly Gln Pro Lys Glu Met Pro Gln Ala Pro Val Leu Ile Ser
 35 40 45

Cys Ala Asp Gln Xaa
 50

<210> 215
 <211> 68
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE

SUBSTITUTE SHEET (RULE 26)

129

<222> (68)

<223> Xaa equals stop translation

<400> 215

Met	Cys	Thr	Gln	Ile	Leu	Val	Phe	Met	Leu	Leu	Ile	Lys	Cys	Ile	Phe
1				5					10					15	

Ser	Ile	Asn	Thr	His	Pro	Ile	Met	Pro	Tyr	Leu	Tyr	Met	Lys	Asn	Lys
		20					25						30		

Val	Thr	Met	Leu	Tyr	Cys	Tyr	Val	Leu	Lys	Phe	Lys	Ser	Leu	Phe	Glu
		35					40					45			

Lys	Pro	Ser	Asn	Trp	Cys	Phe	His	Tyr	Ile	Met	Ile	His	Leu	Asp	Lys
	50					55				60					

Thr	Pro	Asn	Xaa
65			

<210> 216

<211> 57

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (57)

<223> Xaa equals stop translation

<400> 216

Met	Leu	Phe	Val	Ser	Leu	Leu	Val	Met	Trp	Asn	Leu	Phe	Leu	Ser	Ser
1				5					10					15	

Asp	Phe	Leu	Phe	Leu	Trp	Ser	Val	Leu	Gly	Tyr	Tyr	Met	Lys	Val	Arg
		20						25					30		

Leu	Pro	Gln	Ser	Pro	Arg	Glu	Ala	His	Cys	Val	Leu	Leu	Ile	Asp	Leu
		35					40					45			

Lys	Met	Ile	Glu	Ser	Leu	Gly	Gly	Xaa
50						55		

<210> 217

<211> 56

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (56)

<223> Xaa equals stop translation

<400> 217

Met	Glu	Gln	Leu	Leu	Ala	Ala	Val	Val	Phe	Phe	Ser	Ile	Phe	Phe	Leu
1				5					10					15	

SUBSTITUTE SHEET (RULE 26)

130

Asn Leu Leu Ala Leu Lys Met Asn Lys Val Tyr Arg Cys Ile Cys Leu
 20 25 30

Leu Phe Ser Lys Asn Met His Thr Asn Val Cys Phe Tyr Lys Ser Asn
 35 40 45

Thr His Val Ile Ile Cys Met Xaa
 50 55

<210> 218
 <211> 58
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (58)
 <223> Xaa equals stop translation

<400> 218
 Met Cys Trp Lys Pro Lys Cys Ile Leu Leu Leu Ser Phe Val Phe Gln
 1 5 10 15

Cys Val Ala Ser Ser Thr Phe Asp Pro Leu Gly Ser Glu Arg Pro Trp
 20 25 30

Ser Gln Pro Gln Cys Pro Ile Ser Phe Pro Leu Leu Ile Thr Gly Cys
 35 40 45

Cys Trp Phe Ser Met Ser Arg Val Ser Xaa
 50 55

<210> 219
 <211> 59
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (59)
 <223> Xaa equals stop translation

<400> 219
 Met Arg Thr Phe Leu Thr Phe Val Ile Leu Lys Val Ile Leu Ile Phe
 1 5 10 15

Leu Ser Ser Cys Ala Ser Phe Thr Arg Asn Leu Leu Thr Trp Pro Asn
 20 25 30

Asp Val Ser Thr Glu Gln Phe Glu Thr Arg Pro Phe Gly Ser Glu Leu
 35 40 45

Leu Gln Thr Val Ile Asn Val Ser Arg Thr Xaa
 50 55

SUBSTITUTE SHEET (RULE 26)

<210> 220
 <211> 45
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (45)
 <223> Xaa equals stop translation

<400> 220
 Met Arg Phe Phe Phe Gln Ala Tyr Ser Gln Ile Cys Val Gln Asn Phe
 1 5 10 15
 Leu Thr Phe Leu Leu Cys Ile Ile Ile Glu Phe Ile Ala Ala Asp Phe
 20 25 30
 Tyr Asn Asp Ser Cys Cys His Val Ser Leu Asn Asn Xaa
 35 40 45

<210> 221
 <211> 45
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (41)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (45)
 <223> Xaa equals stop translation

<400> 221
 Met Ile Leu Phe Asp Leu Thr Phe Phe Leu Phe Ala Pro Arg Ile Leu
 1 5 10 15
 Ala Ser Gly Ala Cys Ser Cys Ser Ile Tyr Pro Lys Ile Thr Leu Pro
 20 25 30
 Thr Lys Tyr Phe Ala Phe Ile Ile Xaa Thr Ser Phe Xaa
 35 40 45

<210> 222
 <211> 52
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (52)

SUBSTITUTE SHEET (RULE 26)

132

<223> Xaa equals stop translation

<400> 222

Met Asp Gly Leu Ile Met Cys Leu Ile Ile Phe Gln Ile Val Asn Phe
 1 5 10 15

Trp Leu Pro Cys Ile Ile Leu Leu Gly Ile Leu Asn Pro Thr Tyr Lys
 20 25 30

Asn Tyr Val Met Val Ser Thr Lys Cys Trp Met Lys Arg Thr Tyr Glu
 35 40 45

His Met Ser Xaa
 50

<210> 223

<211> 73

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (73)

<223> Xaa equals stop translation

<400> 223

Met Thr Phe Leu Phe Phe Phe Leu Phe Ser Arg Ile Leu Cys Ile Lys
 1 5 10 15

Asn Leu Asp Leu Leu Thr Trp Lys Arg Ser Asn Pro Val Ile Ala Lys
 20 25 30

His Leu Tyr Cys Arg Gly His Ile Thr Lys Lys Ser Lys Gly Pro Ala
 35 40 45

Gln Trp Thr Ile Tyr Phe Ser Asp Val Gln Tyr Lys Ile Ser Leu Pro
 50 55 60

Leu Lys Thr Leu Glu Ser Pro Phe Xaa
 65 70

<210> 224

<211> 71

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (71)

<223> Xaa equals stop translation

<400> 224

Met Leu Phe Trp Lys Phe Gly Ser Phe Leu Phe Phe Cys Leu Pro Leu
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

133

Thr Leu Phe Cys Ile Leu Asn Glu Arg Gly Ile Met His Leu Glu Gly
 20 25 30

Gly Thr Leu Leu Asn Ser Leu Ser His Val Arg His Tyr Leu Arg Leu
 35 40 45

Arg Leu Ser Cys Phe Glu Lys Ile Pro Leu His Arg Ser Ile Phe Ile
 50 55 60

Phe Leu Leu Leu Leu Leu Xaa
 65 70

<210> 225
 <211> 58
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (58)
 <223> Xaa equals stop translation

<400> 225
 Met Ala Gly Cys Cys Leu Lys Leu Phe Gly Val Leu Ser Leu Cys Phe
 1 5 10 15

Leu Cys Gly Leu Ile Ser Ile Glu Arg Val Ile Cys Asn Pro Val Ser
 20 25 30

Ala Asp Phe Gln Val Ser Thr Phe Cys Gln Arg His Cys Leu Leu Arg
 35 40 45

Ser Lys Val Met Phe Pro Ile Arg Gly Xaa
 50 55

<210> 226
 <211> 59
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (59)
 <223> Xaa equals stop translation

<400> 226
 Met Arg Ile Ser Arg Cys Asn Ile Ser Leu Glu Ile Val Ser Pro Ser
 1 5 10 15

Ile Leu Leu Thr Phe Leu Asp Leu Ile Ile Leu Leu Trp Ala Leu Ala
 20 25 30

Ser Cys Tyr Arg Arg Phe Thr Ser Phe Pro Ala Leu Asn Leu Pro Asp
 35 40 45

134

Val Asn Ser Thr Leu His Tyr Leu Gln Gln Xaa
 50 55

<210> 227

<211> 43

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (43)

<223> Xaa equals stop translation

<400> 227

Met Val Ala Pro Leu His Leu Phe Ile Pro Phe Ser Trp Leu Val Arg
 1 5 10 15

Thr Ile Gly Gln Leu Leu Ser Pro Val Gly Lys Ala Leu Ser His Arg
 20 25 30

Ser Asn Gln Met Met Pro Arg Ser Trp Gly Xaa
 35 40

<210> 228

<211> 41

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (41)

<223> Xaa equals stop translation

<400> 228

Met Arg Thr Ser Leu Phe Phe Phe Phe Phe Lys Asn Ile Leu Val Leu
 1 5 10 15

Cys Gly Thr Leu Leu Ile Ser Arg Ser Ser His Ser Gln Ser Ala Pro
 20 25 30

Arg Gly Cys Trp Trp Pro His Lys Xaa
 35 40

<210> 229

<211> 42

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (42)

<223> Xaa equals stop translation

<400> 229

SUBSTITUTE SHEET (RULE 26)

135

Met Leu Trp Lys Tyr Phe Leu Ser Leu Phe Leu Pro Trp Tyr Leu Tyr
 1 5 10 15

Cys Phe Phe Asn Asn Asn Ile Met Phe Tyr Ser Leu His Ser Val Pro
 20 25 30

Met Phe Ile Gln Pro Phe Leu Leu Trp Xaa
 35 40

<210> 230

<211> 165

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (165)

<223> Xaa equals stop translation

<400> 230

Met Ser Thr Arg Arg Leu Gly Val Ala Val Ala Val Leu Gly Gly Phe
 1 5 10 15

Leu Tyr Ala Val Gly Gly Ser Asp Gly Thr Ser Pro Leu Asn Thr Val
 20 25 30

Glu Arg Tyr Asn Pro Gln Glu Asn Arg Trp His Thr Ile Ala Pro Met
 35 40 45

Gly Thr Arg Arg Lys His Leu Gly Cys Ala Val Tyr Gln Asp Met Ile
 50 55 60

Tyr Ala Val Gly Gly Arg Asp Asp Thr Thr Glu Leu Ser Ser Ala Glu
 65 70 75 80

Arg Tyr Asn Pro Arg Thr Asn Gln Trp Ser Pro Val Val Ala Met Thr
 85 90 95

Ser Arg Arg Ser Gly Val Gly Leu Ala Val Val Asn Gly Gln Leu Met
 100 105 110

Ala Val Gly Gly Phe Asp Gly Thr Thr Tyr Leu Lys Thr Ile Glu Val
 115 120 125

Phe Asp Pro Asp Ala Asn Thr Trp Arg Leu Tyr Gly Gly Met Asn Tyr
 130 135 140

Arg Arg Leu Gly Gly Gly Val Gly Val Ile Lys Met Thr His Cys Glu
 145 150 155 160

Ser His Ile Trp Xaa
 165

<210> 231

<211> 52

SUBSTITUTE SHEET (RULE 26)

136

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (52)

<223> Xaa equals stop translation

<400> 231

Met Ala Cys Leu Ile Arg Phe Pro Ala Ile Gly Ser Leu Pro Tyr Ser
 1 5 10 15

Thr Trp Pro Phe Phe Phe Ile Phe Leu Phe Phe Ser Cys Leu Thr
 20 25 30

Phe Ile Pro Phe Ser Pro Leu Ser Ser Phe Cys Glu Pro Tyr Pro Arg
 35 40 45

Lys Glu Pro Xaa
 50

<210> 232

<211> 130

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (130)

<223> Xaa equals stop translation

<400> 232

Met Phe Leu Leu Asn Phe Arg Tyr Ile Met Arg Phe Phe Phe Trp Pro
 1 5 10 15

Met Leu Gln Ala Lys Leu Met Ser Phe His Phe Leu Lys Pro Ile Ile
 20 25 30

Phe Met Asn Ser Leu Ile Leu Cys Leu Lys Gln Ser Cys Ser Cys Glu
 35 40 45

Val Glu Ile Ser Leu Leu Pro Leu Ser Gln Gln Thr His Arg Thr Asp
 50 55 60

Leu Gly Phe Ser His Ser Gly Ser Gln Asn Glu Pro Phe Leu Asn Leu
 65 70 75 80

Asp Lys Arg Ala Ala Glu Ala His Cys Ala Val Met Val Leu Cys Leu
 85 90 95

Leu Gly Arg Asp Leu Lys Ala Arg Arg Ser Arg Glu Gly Pro Ala Leu
 100 105 110

Cys Ser Ser Gln Val Val Ile Cys Ile Leu Lys Leu Ala Arg Lys Arg
 115 120 125

SUBSTITUTE SHEET (RULE 26)

Phe Xaa
130

<210> 233
<211> 55
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (55)
<223> Xaa equals stop translation

<400> 233
Met Glu Phe Lys Leu Val Arg Lys Ile Gln Ile Ala Ile Leu Ile Phe
1 5 10 15
Tyr Leu Tyr Leu Val Ala Val Ala Phe Lys Asn Lys Phe Ser Tyr Lys
20 25 30
Ser Phe Gln Phe Phe Gly Leu Glu Ser Ile Phe Gln Asn Lys Lys Leu
35 40 45
Lys Lys Glu Tyr Leu Met Xaa
50 55

<210> 234
<211> 363
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (307)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (363)
<223> Xaa equals stop translation

<400> 234
Met Arg Thr Leu Phe Asn Leu Leu Trp Leu Ala Leu Ala Cys Ser Pro
1 5 10 15
Val His Thr Thr Leu Ser Lys Ser Asp Ala Lys Lys Ala Ala Ser Lys
20 25 30
Thr Leu Leu Glu Lys Ser Gln Phe Ser Asp Lys Pro Val Gln Asp Arg
35 40 45
Gly Leu Val Val Thr Asp Leu Lys Ala Glu Ser Val Val Leu Glu His
50 55 60
Arg Ser Tyr Cys Ser Ala Lys Ala Arg Asp Arg His Phe Ala Gly Asp

SUBSTITUTE SHEET (RULE 26)

138

65	70	75	80
Val Leu Gly Tyr	Val Thr Pro Trp Asn Ser His Gly Tyr Asp	Val Thr	
	85	90	95
Lys Val Phe Gly Ser Lys Phe Thr Gln Ile Ser Pro Val Trp Leu Gln			
	100	105	110
Leu Lys Arg Arg Gly Arg Glu Met Phe Glu Val Thr Gly Leu His Asp			
	115	120	125
Val Asp Gln Gly Trp Met Arg Ala Val Arg Lys His Ala Lys Gly Leu			
	130	135	140
His Ile Val Pro Arg Leu Leu Phe Glu Asp Trp Thr Tyr Asp Asp Phe			
	145	150	155
Arg Asn Val Leu Asp Ser Glu Asp Glu Ile Glu Glu Leu Ser Lys Thr			
	165	170	175
Val Val Gln Val Ala Lys Asn Gln His Phe Asp Gly Phe Val Val Glu			
	180	185	190
Val Trp Asn Gln Leu Leu Ser Gln Lys Arg Val Thr Asp Gln Leu Gly			
	195	200	205
Met Phe Thr His Lys Glu Phe Glu Gln Leu Ala Pro Val Leu Asp Gly			
	210	215	220
Phe Ser Leu Met Thr Tyr Asp Tyr Ser Thr Ala His Gln Pro Gly Pro			
	225	230	235
Asn Ala Pro Leu Ser Trp Val Arg Ala Cys Val Gln Val Leu Asp Pro			
	245	250	255
Lys Ser Lys Trp Arg Ser Lys Ile Leu Leu Gly Leu Asn Phe Tyr Gly			
	260	265	270
Met Asp Tyr Ala Thr Ser Lys Asp Ala Arg Glu Pro Val Val Gly Ala			
	275	280	285
Arg Tyr Ile Gln Thr Leu Lys Asp His Arg Pro Arg Met Val Trp Asp			
	290	295	300
Ser Gln Xaa Ser Glu His Phe Phe Glu Tyr Lys Lys Ser Arg Ser Gly			
	305	310	315
Arg His Val Val Phe Tyr Pro Thr Leu Lys Ser Leu Gln Val Arg Leu			
	325	330	335
Glu Leu Ala Arg Glu Leu Gly Val Gly Val Ser Ile Trp Glu Leu Gly			
	340	345	350
Gln Gly Leu Asp Tyr Phe Tyr Asp Leu Leu Xaa			
	355	360	

SUBSTITUTE SHEET (RULE 26)

139

<210> 235

<211> 29

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (29)

<223> Xaa equals stop translation

<400> 235

Met	Cys	Met	Cys	Val	Leu	Leu	Cys	Val	Phe	Leu	Ile	Cys	Lys	Tyr	Ser
1				5					10					15	

Lys	Ser	Phe	Leu	Ile	Leu	Arg	Leu	Lys	Phe	Ser	Cys	Xaa
			20					25				

<210> 236

<211> 67

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (67)

<223> Xaa equals stop translation

<400> 236

Met	Gly	Asn	Ala	Cys	Ile	Pro	Leu	Lys	Arg	Ile	Ala	Tyr	Phe	Leu	Cys
1				5					10					15	

Leu	Leu	Ser	Ala	Leu	Leu	Leu	Thr	Glu	Gly	Lys	Lys	Pro	Ala	Asn	Gln
			20					25					30		

Asn	Ala	Leu	Pro	Cys	Val	Leu	Val	Pro	Lys	Ile	Met	Leu	Tyr	Val	Arg
		35					40					45			

Met	Pro	Asp	Pro	Phe	His	Ala	Pro	Phe	Leu	Leu	Met	Leu	Ser	His	Tyr
	50					55					60				

Pro	Leu	Xaa
		65

<210> 237

<211> 114

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (114)

<223> Xaa equals stop translation

<400> 237

Met	Ile	Leu	Ser	Leu	Leu	Phe	Ser	Leu	Gly	Gly	Pro	Leu	Gly	Trp	Gly
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

140
 1 5 10 15
 Leu Leu Gly Ala Trp Ala Gln Ala Ser Ser Thr Ser Leu Ser Asp Leu
 20 25 30
 Gln Ser Ser Arg Thr Pro Gly Val Trp Lys Ala Glu Ala Glu Asp Thr
 35 40 45
 Ser Lys Asp Pro Val Gly Arg Asn Trp Cys Pro Tyr Pro Met Ser Lys
 50 55 60
 Leu Val Thr Leu Leu Ala Leu Cys Lys Thr Glu Lys Phe Leu Ile His
 65 70 75 80
 Ser Gln Gln Pro Cys Pro Gln Glu Leu Gln Thr Ala Arg Lys Ser Lys
 85 90 95
 Ser Cys Thr Ala Trp Pro Thr Ser Gln Cys Thr Arg Ser Ser Arg Arg
 100 105 110
 Cys Xaa

<210> 238
 <211> 106
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (106)
 <223> Xaa equals stop translation

<400> 238
 Met Ala Ile His Lys Ala Leu Val Met Cys Leu Gly Leu Pro Leu Phe
 1 5 10 15
 Leu Phe Pro Gly Ala Trp Ala Gln Gly His Val Pro Pro Gly Cys Ser
 20 25 30
 Gln Gly Leu Asn Pro Leu Tyr Tyr Asn Leu Cys Asp Arg Ser Gly Ala
 35 40 45
 Trp Gly Ile Val Leu Glu Ala Val Ala Gly Ala Gly Ile Val Thr Thr
 50 55 60
 Phe Val Leu Thr Ile Ile Leu Val Ala Ser Leu Pro Phe Val Gln Asp
 65 70 75 80
 Thr Lys Lys Arg Ser Leu Leu Gly Thr Gln Leu Arg Gly Arg Cys His
 85 90 95
 His Thr Ala Gly Thr Met Gly Ser Cys Xaa
 100 105

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141

<210> 239

<211> 15

<212> PRT

<213> Homo sapiens

<400> 239

Gly Leu Gly Pro Ala Gln Val Ala Leu Ser Leu Gln Gly Pro Ala
 1 5 10 15

<210> 240

<211> 82

<212> PRT

<213> Homo sapiens

<400> 240

Ser Ser Trp Met Ala Gly Thr Gln Pro Arg Thr Ser Trp Trp Glu Met
 1 5 10 15

Ser Ser Ala Lys Pro Cys Pro Thr Gly Thr Leu Arg Ser Asn Thr Ser
 20 25 30

Ser His Pro Gln Cys Thr Gly Pro Pro Thr Thr His Pro Met Leu Val
 35 40 45

Gly Glu Asp Met Ser Cys Pro Glu Pro Gln Cys Gly Ala Ser Arg Leu
 50 55 60

Ser Trp Lys Met Leu Asn Ser Ser Pro Leu Met Met Ser Leu Trp Val
 65 70 75 80

Cys Ala

<210> 241

<211> 23

<212> PRT

<213> Homo sapiens

<400> 241

Gln Pro Arg Thr Ser Trp Trp Glu Met Ser Ser Ala Lys Pro Cys Pro
 1 5 10 15

Thr Gly Thr Leu Arg Ser Asn
 20

<210> 242

<211> 23

<212> PRT

<213> Homo sapiens

<400> 242

Met Ser Cys Pro Glu Pro Gln Cys Gly Ala Ser Arg Leu Ser Trp Lys
 1 5 10 15

142

Met Leu Asn Ser Ser Pro Leu
20

<210> 243
<211> 98
<212> PRT
<213> Homo sapiens

<400> 243
Trp Val Ala Leu Tyr Ile Glu Gly Gly Met Lys Tyr Leu Thr Leu Val
1 5 10 15

Phe Leu Leu Gly Arg Ala Trp Arg Met Thr Ser Pro Thr Arg Arg Ser
20 25 30

Trp Ala Gly Ser Gln Pro Ser Arg Asn Ser Asn Thr Leu Gly Thr Trp
35 40 45

Thr Lys Thr Ser Ser Ser Pro Phe Ser Met Lys Trp Ala Trp Gly Gln
50 55 60

Ala Ala Thr Thr Gln Arg Cys Arg Cys Ser Ser Leu Ser Val Arg Leu
65 70 75 80

Lys Lys Ser Ser Val Lys Ser His Trp Arg Met Ser Ser Asn Ser Leu
85 90 95

Leu Ser

<210> 244
<211> 20
<212> PRT
<213> Homo sapiens

<400> 244
Gly Gly Met Lys Tyr Leu Thr Leu Val Phe Leu Leu Gly Arg Ala Trp
1 5 10 15

Arg Met Thr Ser
20

<210> 245
<211> 25
<212> PRT
<213> Homo sapiens

<400> 245
Ser Gln Pro Ser Arg Asn Ser Asn Thr Leu Gly Thr Trp Thr Lys Thr
1 5 10 15

Ser Ser Ser Pro Phe Ser Met Lys Trp
20 25

SUBSTITUTE SHEET (RULE 26)

<210> 246
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 246
 Thr Thr Gln Arg Cys Arg Cys Ser Ser Leu Ser Val Arg Leu Lys Lys
 1 5 10 15
 Ser Ser Val Lys Ser His Trp Arg Met Ser
 20 25

<210> 247
 <211> 223
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (13)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (14)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (15)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (27)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (108)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (113)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (117)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (121)

SUBSTITUTE SHEET (RULE 26)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (122)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (125)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (129)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (130)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 247

Ala	Ser	Thr	Leu	Ala	Gln	Thr	Thr	Gly	Thr	Cys	Lys	Xaa	Xaa	Xaa	Ser
1				5					10					15	

Ser	Arg	Arg	Ala	Arg	Ser	Arg	Thr	Gln	Arg	Xaa	Phe	Gln	Leu	Arg	Pro
			20					25					30		

Asp	Lys	Arg	Ser	Ala	Pro	Ser	Leu	Leu	Gln	Phe	Ile	Gln	Ala	Gln	Glu
			35				40					45			

Glu	Leu	Ser	Lys	Glu	Asn	Thr	Gly	Arg	Gln	Leu	Ala	Ala	Arg	Glu	Ala
	50					55					60				

Val	Leu	Ala	Leu	Glu	Gly	Ser	Thr	Gln	Leu	Thr	Gly	Pro	Val	Thr	Gln
65					70					75					80

Val	Ala	Ala	Ser	Lys	Thr	His	Cys	Ser	Gly	Met	Ala	Leu	Thr	Ala	Ser
				85					90					95	

Pro	Val	Pro	Val	Leu	Gly	Ala	Ala	Pro	Ala	Lys	Xaa	Pro	Thr	Gln	Asn
			100					105					110		

Xaa	Pro	Gly	Gln	Xaa	Gly	Arg	Ala	Xaa	Xaa	Lys	Val	Xaa	Thr	Ser	Trp
		115					120					125			

Xaa	Xaa	Val	Ala	Thr	Lys	Val	Leu	His	Gly	Leu	Glu	Val	Ser	Thr	His
	130					135					140				

Leu	Gly	Lys	Arg	Lys	Leu	Ser	Gly	Arg	Ser	Trp	Leu	Pro	Gly	Pro	Ala
145					150					155					160

Leu	His	Ala	Thr	Pro	Ser	Gln	Ser	His	Thr	Gln	Thr	Gly	Ser	Gln	Ile
				165					170					175	

Val	His	Pro	Pro	Gln	Gly	Glu	Val	Arg	Glu	Val	Gly	Arg	Gly	Arg	Gly
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

SUBSTITUTE SHEET (RULE 26)

145

180

185

190

Gln Pro Pro Ala Gln Pro Val His Ala His Pro Ser Gln Gln His Pro
 195 200 205

Ser Pro Ala His Leu Ala Gly Leu Ser Leu Trp Thr Gly Thr Ala
 210 215 220

<210> 248

<211> 140

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (12)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (59)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (60)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (80)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (82)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 248

Ala Met Leu Glu Thr Trp Arg Pro Gly Pro Ser Xaa Gly Glu Leu Ala
 1 5 10 15

Thr Asn Ser Gly Gln Arg Ala Ser Gln Asp Ser Gln His Ser Pro Pro
 20 25 30

His Val Arg Ala His Leu Leu Ile Ser Pro Leu Pro Ala Phe Pro Ser
 35 40 45

Met Gly Gly Pro Ala Gly Arg Ser Ala Pro Xaa Xaa Leu Thr Glu Thr
 50 55 60

Lys Ser Glu Leu Gln Arg Leu Arg Arg Arg Gln Ala Arg Ala Ser Xaa
 65 70 75 80

Ser Xaa Pro Ala Gly Glu Pro Gly Ala Gly His Ser Asp Ser Phe Asn
 85 90 95

SUBSTITUTE SHEET (RULE 26)

Cys Val Pro Thr Asn Gly Gln Pro Leu Arg Ser Cys Ser Leu Ser Lys
 100 105 110

Leu Arg Arg Ser Phe Leu Lys Arg Thr Gln Gly Asp Ser Trp Leu Pro
 115 120 125

Glu Lys Gln Ser Trp Leu Trp Lys Ala Pro Pro Ser
 130 135 140

<210> 249

<211> 122

<212> PRT

<213> Homo sapiens

<400> 249

Ser His Gln Ser His Leu Ile Asn Pro Ala Ser Ser Ala Lys Gly Ser
 1 5 10 15

Trp Ala Gln Leu Lys Ala Gln Pro Pro Ala His Val Leu Gly Gly Thr
 20 25 30

Gly Gln Glu Gly Pro Pro Pro Thr Ala Asp Gln Pro Glu Ser Pro Gly
 35 40 45

Trp Asp Pro Ser Ser Phe Thr Asn Gly Ser Ser Gly Pro Arg Ala Leu
 50 55 60

Pro Thr Ser Val His Pro Thr Leu Gln Gln Gly Ala Pro Cys Arg Arg
 65 70 75 80

Asn Trp Ala Pro Cys Arg Gly Leu Val Glu Thr Arg Met Leu Arg Arg
 85 90 95

Gln Leu Pro His Gly Thr Ser Lys Arg Asp Leu Gly Trp Ala Ser Leu
 100 105 110

Gln Arg Gly Ser Pro Gln Glu Thr Pro Gln
 115 120

<210> 250

<211> 35

<212> PRT

<213> Homo sapiens

<400> 250

Arg Pro Asp Lys Arg Ser Ala Pro Ser Leu Leu Gln Phe Ile Gln Ala
 1 5 10 15

Gln Glu Glu Leu Ser Lys Glu Asn Thr Gly Arg Gln Leu Ala Ala Arg
 20 25 30

Glu Ala Val
 35

SUBSTITUTE SHEET (RULE 26)

<210> 251
 <211> 33
 <212> PRT
 <213> Homo sapiens

<400> 251
 Ala Thr Pro Ser Gln Ser His Thr Gln Thr Gly Ser Gln Ile Val His
 1 5 10 15
 Pro Pro Gln Gly Glu Val Arg Glu Val Gly Arg Gly Arg Gly Gln Pro
 20 25 30

Pro

<210> 252
 <211> 29
 <212> PRT
 <213> Homo sapiens

<400> 252
 Gln Asp Ser Gln His Ser Pro Pro His Val Arg Ala His Leu Leu Ile
 1 5 10 15
 Ser Pro Leu Pro Ala Phe Pro Ser Met Gly Gly Pro Ala
 20 25

<210> 253
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 253
 Asp Ser Phe Asn Cys Val Pro Thr Asn Gly Gln Pro Leu Arg Ser Cys
 1 5 10 15
 Ser Leu Ser Lys Leu Arg Arg Ser Phe Leu Lys Arg
 20 25

<210> 254
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 254
 Lys Gly Ser Trp Ala Gln Leu Lys Ala Gln Pro Pro Ala His Val Leu
 1 5 10 15
 Gly Gly Thr Gly Gln Glu Gly Pro Pro
 20 25

<210> 255

148

<211> 26
<212> PRT
<213> Homo sapiens

<400> 255
Ala Pro Ser Leu Leu Gln Phe Ile Gln Ala Gln Glu Glu Leu Ser Lys
1 5 10 15
Glu Asn Thr Gly Arg Gln Leu Ala Ala Arg
20 25

<210> 256
<211> 6
<212> PRT
<213> Homo sapiens

<400> 256
Lys Pro Ser His Gln Pro
1 5

<210> 257
<211> 21
<212> PRT
<213> Homo sapiens

<400> 257
Cys Ser Tyr Arg Pro Gln Phe Pro Val Asp Pro Arg Val Arg Ala Thr
1 5 10 15
Cys Ile Val Phe Asn
20

<210> 258
<211> 128
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (46)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (60)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (66)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 258
Gly Thr Glu Asn Leu Leu Ala Pro Glu Arg Thr Ile Leu Ser Arg Ala

SUBSTITUTE SHEET (RULE 26)

149

1	5	10	15
Gln Met Gly Lys Cys Met Ala Thr Pro Ala Pro Cys Val Arg Ser Ser	20	25	30
Ser Lys Gln Lys Lys Lys Lys Arg Lys Arg Arg Lys Val Xaa Gln Glu	35	40	45
Thr Lys Asp Asn Leu Arg Val Gln Leu Pro Leu Xaa Ser Cys Val Val	50	55	60
Asn Xaa Ala Asn Pro Gly Lys Thr Asp Gly Phe Phe Ala Pro Glu Arg	65	70	75
Met Thr Pro Ser Arg Ala Gln Met Glu Lys Cys Met Ala Thr Pro Ala	85	90	95
Pro Cys Val Arg Pro Ser Phe Asn Lys Lys Lys Glu Gln Glu Gln Arg	100	105	110
Leu Lys Glu Lys Leu Gln Arg Lys Ser Ala Val Asn Phe Gly Thr Lys	115	120	125

<210> 259
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 259
 Leu Leu Ala Pro Glu Arg Thr Ile Leu Ser Arg Ala Gln Met Gly Lys
 1 5 10 15
 Cys Met Ala Thr Pro Ala Pro Cys Val Arg
 20 25

<210> 260
 <211> 24
 <212> PRT
 <213> Homo sapiens

<400> 260
 Pro Gly Lys Thr Asp Gly Phe Phe Ala Pro Glu Arg Met Thr Pro Ser
 1 5 10 15
 Arg Ala Gln Met Glu Lys Cys Met
 20

<210> 261
 <211> 17
 <212> PRT
 <213> Homo sapiens

<400> 261

Glu Gln Arg Leu Lys Glu Lys Leu Gln Arg Lys Ser Ala Val Asn Phe
 1 5 10 15

Gly

<210> 262

<211> 186

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (42)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (68)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (69)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 262

Lys Thr Leu Leu Glu Asn Phe Ser Thr Gln Gly Thr Phe Val Ala Met
 1 5 10 15

His Pro Ala Val Arg Ala Thr Asp Trp Ile Thr Leu Pro Cys Thr Lys
 20 25 30

Lys Pro Ser Ile Ser His Leu Phe Phe Xaa Phe Leu Ala Lys Ile Leu
 35 40 45

Phe Ser Ile Ser Ser Asn Ser Ser Phe Thr Leu Ser Leu Gly Ile Phe
 50 55 60

Ser Phe Phe Xaa Xaa Gln Leu Ser Thr His Cys Thr Leu Ile Ala Met
 65 70 75 80

Arg Leu Pro Ile Arg Thr Lys Asn Arg Ile Ile Phe Pro Cys Ala Ser
 85 90 95

Lys Ser Ser Ile Ser Asn Lys Gly Pro Lys Ser Thr Ala Tyr Ile Leu
 100 105 110

Leu Trp Ile Thr Ala Leu Thr Phe Pro Phe Thr Phe Tyr Thr Asn Leu
 115 120 125

Gly Pro Gly Phe Arg Ile Leu Ser Thr Gln Cys Thr Ser Val Val Ile
 130 135 140

SUBSTITUTE SHEET (RULE 26)

151

Cys Phe Pro Ile Cys Ala Thr Asn Ser Phe Ile Ile Ile Arg Thr Asp
 145 150 155 160

Lys Ile Pro Ile Ser Phe Ser Phe Phe Lys Ile Ile Thr Ile Gln Leu
 165 170 175

Cys Trp Gly Ser Ser Leu Gly Ser Ser Cys
 180 185

<210> 263

<211> 22

<212> PRT

<213> Homo sapiens

<400> 263

Met His Pro Ala Val Arg Ala Thr Asp Trp Ile Thr Leu Pro Cys Thr
 1 5 10 15

Lys Lys Pro Ser Ile Ser
 20

<210> 264

<211> 17

<212> PRT

<213> Homo sapiens

<400> 264

Leu Ile Ala Met Arg Leu Pro Ile Arg Thr Lys Asn Arg Ile Ile Phe
 1 5 10 15

Pro

<210> 265

<211> 26

<212> PRT

<213> Homo sapiens

<400> 265

Ser Ser Ile Ser Asn Lys Gly Pro Lys Ser Thr Ala Tyr Ile Leu Leu
 1 5 10 15

Trp Ile Thr Ala Leu Thr Phe Pro Phe Thr
 20 25

<210> 266

<211> 23

<212> PRT

<213> Homo sapiens

<400> 266

Ile Ile Ile Arg Thr Asp Lys Ile Pro Ile Ser Phe Ser Phe Phe Lys
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

Ile Ile Thr Ile Gln Leu Cys
20

<210> 267

<211> 165

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (147)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (153)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 267

Asn Asp Gly Gln Cys Leu Ala Tyr Asn Thr Thr His Tyr Arg Glu Arg
1 5 10 15

Ala Met Thr Ser His Ala Arg Val Ser Leu Gly Pro Ser Arg Asp Pro
20 25 30

Leu Glu Arg Pro Pro Phe Phe Phe Phe Phe Phe Phe Phe Phe Phe Phe
35 40 45

Lys Phe Glu His Thr Gly Thr His Gly Thr Leu Val Ser Met His Phe
50 55 60

Ala Ile Trp Ala Thr Asp Arg Ile Met Leu Pro Gly Ala Tyr Lys Cys
65 70 75 80

Ser Ile Pro His Leu Val Pro Lys Phe Thr Ala Asp Phe Leu Cys Ser
85 90 95

Phe Ser Phe Ser Leu Cys Ser Cys Ser Phe Phe Leu Leu Lys Glu Gly
100 105 110

Leu Thr His Gly Ala Gly Val Ala Met His Phe Ser Ile Trp Ala Leu
115 120 125

Asp Gly Val Ile Leu Ser Gly Ala Lys Lys Pro Ser Val Phe Pro Gly
130 135 140

Phe Ala Xaa Phe Thr Thr Gln Leu Xaa Lys Gly Ser Cys Thr Leu Arg
145 150 155 160

Leu Ser Phe Val Ser
165

<210> 268

<211> 22

SUBSTITUTE SHEET (RULE 26)

<212> PRT

<213> Homo sapiens

<400> 268

Cys Leu Ala Tyr Asn Thr Thr His Tyr Arg Glu Arg Ala Met Thr Ser
 1 5 10 15

His Ala Arg Val Ser Leu
 20

<210> 269

<211> 31

<212> PRT

<213> Homo sapiens

<400> 269

Gly Thr Leu Val Ser Met His Phe Ala Ile Trp Ala Thr Asp Arg Ile
 1 5 10 15

Met Leu Pro Gly Ala Tyr Lys Cys Ser Ile Pro His Leu Val Pro
 20 25 30

<210> 270

<211> 24

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (18)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (24)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 270

Gly Val Ile Leu Ser Gly Ala Lys Lys Pro Ser Val Phe Pro Gly Phe
 1 5 10 15

Ala Xaa Phe Thr Thr Gln Leu Xaa
 20

<210> 271

<211> 141

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (26)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (38)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (44)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (57)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (58)
 <223> Xaa equals any of the naturally occurring L-amino acids

<400> 271
 Lys Lys Ala Ser His Met Glu Gln Val Leu Pro Cys Ile Phe Pro Ser
 1 5 10 15
 Gly Pro Trp Met Gly Ser Phe Ser Leu Xaa Gln Lys Ser Arg Pro Phe
 20 25 30
 Phe Leu Asp Leu Arg Xaa Ser Leu His Asn Ser Xaa Lys Glu Ala Val
 35 40 45
 Leu Leu Asp Cys Leu Leu Phe Leu Xaa Xaa Pro Ser Phe Phe Phe Phe
 50 55 60
 Ser Ser Ser Ser Ala Trp Lys Lys Thr Ser His Met Glu Gln Val Leu
 65 70 75 80
 Pro Cys Thr Phe Pro Ser Gly Pro Trp Ile Gly Leu Phe Ser Leu Val
 85 90 95
 Gln Ala Ser Phe Pro Phe Leu Thr Ser Phe Arg Tyr Ser Leu Gln Ser
 100 105 110
 Ser Ala Tyr Glu Val Ala Phe Pro Asp Ser Leu Leu Phe Leu Ala Arg
 115 120 125
 Ala Ser Ala Phe Phe Phe Ser Ser Phe Ser Ala Trp Lys
 130 135 140

<210> 272
 <211> 28
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (15)

SUBSTITUTE SHEET (RULE 26)

155

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (27)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 272

Cys	Ile	Phe	Pro	Ser	Gly	Pro	Trp	Met	Gly	Ser	Phe	Ser	Leu	Xaa	Gln
1				5					10					15	

Lys	Ser	Arg	Pro	Phe	Phe	Leu	Asp	Leu	Arg	Xaa	Ser
			20					25			

<210> 273

<211> 28

<212> PRT

<213> Homo sapiens

<400> 273

Trp	Ile	Gly	Leu	Phe	Ser	Leu	Val	Gln	Ala	Ser	Phe	Pro	Phe	Leu	Thr
1				5				10						15	

Ser	Phe	Arg	Tyr	Ser	Leu	Gln	Ser	Ser	Ala	Tyr	Glu
			20				25				

<210> 274

<211> 79

<212> PRT

<213> Homo sapiens

<400> 274

Asn	Ser	Ala	Val	Asn	Ile	Lys	Ile	Arg	Gln	Arg	Met	Glu	Tyr	Phe	Ser
1				5				10						15	

Val	Pro	Glu	Lys	Met	Thr	Leu	Phe	Val	Val	Gln	Met	Gly	Lys	Cys	Met
			20					25					30		

Ala	Thr	Cys	Val	Pro	Cys	Val	Lys	Pro	Thr	Ser	Lys	Gln	Lys	Met	Lys
			35				40					45			

Lys	Arg	Lys	Arg	Leu	Lys	His	Glu	Leu	Glu	Thr	Lys	Glu	Asn	Leu	Glu
			50			55				60					

Lys	Gln	Pro	His	Met	Gln	Ser	Phe	Ala	Val	Asn	Ile	Glu	Ser	Leu
	65				70					75				

<210> 275

<211> 23

<212> PRT

<213> Homo sapiens

<400> 275

Ile	Lys	Ile	Arg	Gln	Arg	Met	Glu	Tyr	Phe	Ser	Val	Pro	Glu	Lys	Met
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

SUBSTITUTE SHEET (RULE 26)

156

1

5

10

15

Thr Leu Phe Val Val Gln Met
20

<210> 276

<211> 25

<212> PRT

<213> Homo sapiens

<400> 276

Val Lys Pro Thr Ser Lys Gln Lys Met Lys Lys Arg Lys Arg Leu Lys
1 5 10 15

His Glu Leu Glu Thr Lys Glu Asn Leu
20 25

<210> 277

<211> 63

<212> PRT

<213> Homo sapiens

<400> 277

Pro Arg Val Arg Gly Thr Val Val Arg Leu Arg Gln His Arg Pro Ser
1 5 10 15

Ala Tyr Ile Leu Val Ser Thr Val Leu Thr Leu Met Val Pro Trp His
20 25 30

Ser Leu Asp Pro Asp Ser Ala Leu Ala Asp Ala Phe Tyr Gln Arg Gly
35 40 45

Tyr Arg Trp Ala Gly Phe Ile Val Ala Ala Gly Ser Ile Cys Ala
50 55 60

<210> 278

<211> 25

<212> PRT

<213> Homo sapiens

<400> 278

Thr Val Val Arg Leu Arg Gln His Arg Pro Ser Ala Tyr Ile Leu Val
1 5 10 15

Ser Thr Val Leu Thr Leu Met Val Pro
20 25

<210> 279

<211> 26

<212> PRT

<213> Homo sapiens

<400> 279

SUBSTITUTE SHEET (RULE 26)

157

Trp His Ser Leu Asp Pro Asp Ser Ala Leu Ala Asp Ala Phe Tyr Gln
 1 5 10 15

Arg Gly Tyr Arg Trp Ala Gly Phe Ile Val
 20 25

<210> 280

<211> 101

<212> PRT

<213> Homo sapiens

<400> 280

Thr Pro Ser Cys Ser Ala Ser Ser Ser Pro Cys His Ala Leu Ser Met
 1 5 10 15

Pro Trp Pro Pro Met Gly Ser Ser Ser Arg Cys Leu Pro Met Cys Thr
 20 25 30

Pro Gly His Arg Cys Leu Trp Arg Ala Pro Trp Arg Ser Gly Ser Ser
 35 40 45

Arg Pro Ser Trp His Cys Cys Trp Thr Trp Ser Arg Trp Phe Ser Ser
 50 55 60

Cys Pro Leu Ala His Ser Trp Pro Thr His Ser Trp Pro Pro Val Ser
 65 70 75 80

Leu Cys Cys Ala Ser Arg Ser Leu Pro Arg Pro Ala Pro Gln Ala Gln
 85 90 95

Pro Ala Leu Ala Pro
 100

<210> 281

<211> 24

<212> PRT

<213> Homo sapiens

<400> 281

Leu Ser Met Pro Trp Pro Pro Met Gly Ser Ser Ser Arg Cys Leu Pro
 1 5 10 15

Met Cys Thr Pro Gly His Arg Cys
 20

<210> 282

<211> 27

<212> PRT

<213> Homo sapiens

<400> 282

Ala Pro Trp Arg Ser Gly Ser Ser Arg Pro Ser Trp His Cys Cys Trp
 1 5 10 15

158

Thr Trp Ser Arg Trp Phe Ser Ser Cys Pro Leu
 20 25

<210> 283

<211> 22

<212> PRT

<213> Homo sapiens

<400> 283

Thr His Ser Trp Pro Pro Val Ser Leu Cys Cys Ala Ser Arg Ser Leu
 1 5 10 15

Pro Arg Pro Ala Pro Gln
 20

<210> 284

<211> 60

<212> PRT

<213> Homo sapiens

<400> 284

Ala Tyr Ile Leu Val Ser Thr Val Leu Thr Leu Met Val Pro Trp His
 1 5 10 15

Ser Leu Asp Pro Asp Ser Ala Leu Ala Asp Ala Phe Tyr Gln Arg Gly
 20 25 30

Tyr Arg Trp Ala Gly Phe Ile Val Ala Ala Gly Ser Ile Cys Ala Met
 35 40 45

Asn Thr Val Leu Leu Ser Leu Leu Phe Ser Leu Pro
 50 55 60

<210> 285

<211> 31

<212> PRT

<213> Homo sapiens

<400> 285

Pro Trp His Ser Leu Asp Pro Asp Ser Ala Leu Ala Asp Ala Phe Tyr
 1 5 10 15

Gln Arg Gly Tyr Arg Trp Ala Gly Phe Ile Val Ala Ala Gly Ser
 20 25 30

<210> 286

<211> 27

<212> PRT

<213> Homo sapiens

<400> 286

Arg Ile Val Tyr Ala Met Ala Ala Asp Gly Leu Phe Phe Gln Val Phe
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

Ala His Val His Pro Arg Thr Gln Val Pro Val
 20 25

<210> 287
 <211> 16
 <212> PRT
 <213> Homo sapiens

<400> 287
 Asp Leu Glu Ser Leu Val Gln Phe Leu Ser Leu Gly Thr Leu Leu Ala
 1 5 10 15

<210> 288
 <211> 15
 <212> PRT
 <213> Homo sapiens

<400> 288
 Tyr Thr Phe Val Ala Thr Ser Ile Ile Val Leu Arg Phe Gln Lys
 1 5 10 15

<210> 289
 <211> 31
 <212> PRT
 <213> Homo sapiens

<400> 289
 Leu Thr Lys Gln Gln Ser Ser Phe Ser Asp His Leu Gln Leu Val Gly
 1 5 10 15

Thr Val His Ala Ser Val Pro Glu Pro Gly Glu Leu Lys Pro Ala
 20 25 30

<210> 290
 <211> 50
 <212> PRT
 <213> Homo sapiens

<400> 290
 Leu Arg Pro Tyr Leu Gly Phe Leu Asp Gly Tyr Ser Pro Gly Ala Val
 1 5 10 15

Val Thr Trp Ala Leu Gly Val Met Leu Ala Ser Ala Ile Thr Ile Gly
 20 25 30

Cys Val Leu Val Phe Gly Asn Ser Thr Leu His Leu Pro His Trp Gly
 35 40 45

Tyr Ile

160

50

<210> 291

<211> 27

<212> PRT

<213> Homo sapiens

<400> 291

Pro Gly Ala Val Val Thr Trp Ala Leu Gly Val Met Leu Ala Ser Ala
1 5 10 15

Ile Thr Ile Gly Cys Val Leu Val Phe Gly Asn
20 25

<210> 292

<211> 53

<212> PRT

<213> Homo sapiens

<400> 292

Gly Ala His Gln Gln Gln Tyr Arg Glu Asp Leu Phe Gln Ile Pro Met
1 5 10 15

Val Pro Leu Ile Pro Ala Leu Ser Ile Val Leu Asn Ile Cys Leu Met
20 25 30

Leu Lys Leu Ser Tyr Leu Thr Trp Val Arg Phe Ser Ile Trp Leu Leu
35 40 45

Met Gly Leu Ala Val
50

<210> 293

<211> 26

<212> PRT

<213> Homo sapiens

<400> 293

Met Val Pro Leu Ile Pro Ala Leu Ser Ile Val Leu Asn Ile Cys Leu
1 5 10 15

Met Leu Lys Leu Ser Tyr Leu Thr Trp Val
20 25

<210> 294

<211> 29

<212> PRT

<213> Homo sapiens

<400> 294

Tyr Phe Gly Tyr Gly Ile Arg His Ser Lys Glu Asn Gln Arg Glu Leu
1 5 10 15

SUBSTITUTE SHEET (RULE 26)

161

Pro Gly Leu Asn Ser Thr His Tyr Val Val Phe Pro Arg
 20 25

<210> 295
 <211> 23
 <212> PRT
 <213> Homo sapiens

<400> 295
 Phe Pro Pro Ser Pro Ala Pro Pro His Ser Leu Pro Leu Arg Ser Trp
 1 5 10 15

Leu Trp Ser Arg Gln Met Gly
 20

<210> 296
 <211> 148
 <212> PRT
 <213> Homo sapiens

<400> 296
 Gly Thr Ser Phe Arg Gly Met Ile Ser Thr Gln Pro Gly Ser Thr Pro
 1 5 10 15

Leu Ala Ser Phe Lys Ile Leu Ala Leu Glu Ser Ala Asp Gly His Gly
 20 25 30

Gly Cys Ser Ala Gly Asn Asp Ile Gly Pro Tyr Gly Glu Arg Asp Asp
 35 40 45

Gln Gln Val Phe Ile Gln Lys Val Val Pro Ser Ala Ser Gln Leu Phe
 50 55 60

Val Arg Leu Ser Ser Thr Gly Gln Arg Val Cys Ser Val Arg Ser Val
 65 70 75 80

Asp Gly Ser Pro Thr Thr Ala Phe Thr Val Leu Glu Cys Glu Gly Ser
 85 90 95

Pro Ala Ala Arg Leu Ser Ala Pro Ala Leu Pro Ala His Trp Pro Gly
 100 105 110

Gln Arg Gln Leu Gly His Val Gly Pro Asn His Arg His Gly Arg Pro
 115 120 125

Arg Pro Gly Pro Cys Arg Trp Pro Asp Gly Ala Arg Ala Asp Gly Thr
 130 135 140

Ala Gly Thr Leu
 145

<210> 297
 <211> 29
 <212> PRT

SUBSTITUTE SHEET (RULE 26)

162

<213> Homo sapiens

<400> 297

Pro Gly Ser Thr Pro Leu Ala Ser Phe Lys Ile Leu Ala Leu Glu Ser
 1 5 10 15

Ala Asp Gly His Gly Gly Cys Ser Ala Gly Asn Asp Ile
 20 25

<210> 298

<211> 24

<212> PRT

<213> Homo sapiens

<400> 298

Gly Glu Arg Asp Asp Gln Gln Val Phe Ile Gln Lys Val Val Pro Ser
 1 5 10 15

Ala Ser Gln Leu Phe Val Arg Leu
 20

<210> 299

<211> 25

<212> PRT

<213> Homo sapiens

<400> 299

Arg Ser Val Asp Gly Ser Pro Thr Thr Ala Phe Thr Val Leu Glu Cys
 1 5 10 15

Glu Gly Ser Pro Ala Ala Arg Leu Ser
 20 25

<210> 300

<211> 26

<212> PRT

<213> Homo sapiens

<400> 300

Pro Ala Leu Pro Ala His Trp Pro Gly Gln Arg Gln Leu Gly His Val
 1 5 10 15

Gly Pro Asn His Arg His Gly Arg Pro Arg
 20 25

<210> 301

<211> 168

<212> PRT

<213> Homo sapiens

<400> 301

Pro Phe Ile Pro Arg Arg Pro Trp Pro Glu Pro Gly Val Pro Thr Gly
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

163

Ile Arg Glu Ala Pro Glu Ser Pro Arg Thr Arg Ala Ser Gln Gly Ile
 20 25 30
 Met Ala Ala Ala Leu Phe Lys Lys Glu Val Ser Leu Ser Phe Ile Leu
 35 40 45
 Gly Gly Val Arg Gly Val Pro Arg Pro Leu Glu Gly His Gly Ala Gly
 50 55 60
 Val Gly Gly Arg Arg Arg Ser Gly Pro Leu Arg Thr Ser Ser Trp Gln
 65 70 75 80
 Arg Ser Thr Lys Leu Pro Pro Pro Arg Arg Arg Ala Ser Ala Cys Gly
 85 90 95
 Gly Leu Gly Leu Pro Arg Trp Pro Asp Lys Glu Val Leu Leu Glu Ala
 100 105 110
 Glu Trp Arg Leu Val Arg Glu Met Arg Gly Glu Gly Leu Gly Arg Gln
 115 120 125
 Pro His Glu Gly Ala Glu Arg Ser Arg Arg Gly Gln Leu Thr Val Phe
 130 135 140
 Gln Leu Phe His Gln Leu Leu Leu Arg Gln Ala Thr Cys Arg Gly Leu
 145 150 155 160
 Ala Glu Ala Val His Gly Gly Gly
 165

<210> 302
 <211> 32
 <212> PRT
 <213> Homo sapiens

<400> 302
 Pro Gly Val Pro Thr Gly Ile Arg Glu Ala Pro Glu Ser Pro Arg Thr
 1 5 10 15
 Arg Ala Ser Gln Gly Ile Met Ala Ala Ala Leu Phe Lys Lys Glu Val
 20 25 30

<210> 303
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 303
 Phe Ile Leu Gly Gly Val Arg Gly Val Pro Arg Pro Leu Glu Gly His
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

164

Gly Ala Gly Val Gly Gly Arg Arg Arg Ser Gly Pro
 20 25

<210> 304
 <211> 24
 <212> PRT
 <213> Homo sapiens

<400> 304
 Gly Leu Pro Arg Trp Pro Asp Lys Glu Val Leu Leu Glu Ala Glu Trp
 1 5 10 15

Arg Leu Val Arg Glu Met Arg Gly
 20

<210> 305
 <211> 23
 <212> PRT
 <213> Homo sapiens

<400> 305
 Gly Ala Glu Arg Ser Arg Arg Gly Gln Leu Thr Val Phe Gln Leu Phe
 1 5 10 15

His Gln Leu Leu Leu Arg Gln
 20

<210> 306
 <211> 15
 <212> PRT
 <213> Homo sapiens

<400> 306
 His Ala Ser Ala His Ala Ser Ala His Ala Ser Gly Cys Gly Ala
 1 5 10 15

<210> 307
 <211> 118
 <212> PRT
 <213> Homo sapiens

<400> 307
 Gln Gly Val Gly Val Ala Asp Glu Gly Gly Leu Glu Arg Gln Arg Val
 1 5 10 15

Asp Ala Gly Ala Arg Leu Gly His Met Gly Gln Pro Val Ala Phe Ser
 20 25 30

Thr Arg Gln Leu His Leu Ala Leu Pro Ala Pro Gly Thr Ala Gly Val
 35 40 45

Thr Val Pro His Pro His Ala Arg Glu Gly Val Val Gly Asp Leu Pro
 50 55 60

SUBSTITUTE SHEET (RULE 26)

165

Leu Val Pro Asp Ala Glu Asp Pro Thr Val Gly Val Pro Ala Glu Gly
 65 70 75 80

Leu Leu Val Leu Gly His Val Val Glu Arg Ala Glu Leu Ile Leu Val
 85 90 95

Arg Gly Leu His Gln Ala Glu Ala Leu Ala Arg Glu Ser Glu Glu Met
 100 105 110

His Gly Ser Arg His Gly
 115

<210> 308

<211> 25

<212> PRT

<213> Homo sapiens

<400> 308

Glu Gly Gly Leu Glu Arg Gln Arg Val Asp Ala Gly Ala Arg Leu Gly
 1 5 10 15

His Met Gly Gln Pro Val Ala Phe Ser
 20 25

<210> 309

<211> 29

<212> PRT

<213> Homo sapiens

<400> 309

Leu Ala Leu Pro Ala Pro Gly Thr Ala Gly Val Thr Val Pro His Pro
 1 5 10 15

His Ala Arg Glu Gly Val Val Gly Asp Leu Pro Leu Val
 20 25

<210> 310

<211> 28

<212> PRT

<213> Homo sapiens

<400> 310

Pro Ala Glu Gly Leu Leu Val Leu Gly His Val Val Glu Arg Ala Glu
 1 5 10 15

Leu Ile Leu Val Arg Gly Leu His Gln Ala Glu Ala
 20 25

<210> 311

<211> 125

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (32)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 311

His	Leu	Phe	Lys	Phe	Phe	Tyr	Thr	Ile	Ala	Phe	Met	Gln	Trp	Phe	Thr
1				5					10					15	

Glu	Phe	Met	Glu	Leu	Phe	Leu	Ser	Val	Trp	Glu	Leu	Ile	Lys	Thr	Xaa
			20					25					30		

Asn	Leu	Cys	Phe	Val	Cys	Phe	Ser	Glu	His	Lys	Pro	Gly	Gln	Leu	Val
		35					40					45			

Pro	Ala	Gly	Pro	Thr	Ser	Gln	Leu	Leu	Cys	Arg	Ala	Leu	Gly	Arg	Val
	50					55					60				

His	Leu	Cys	Ser	Pro	Thr	Thr	Arg	Ser	Gln	Thr	Pro	Thr	Gln	Ser	Trp
65					70					75					80

Val	Thr	Pro	Gln	Leu	Leu	Trp	Arg	Leu	Gly	Ser	Gly	Arg	Leu	Val	Ala
			85						90					95	

Gln	Val	Leu	Gln	Val	Gly	Ser	Phe	Cys	Gly	Pro	Arg	Val	Gly	Asp	Ala
		100						105					110		

Val	Leu	Gly	Glu	Gln	Thr	Phe	Gln	Pro	Phe	Asp	Leu	Leu
	115						120				125	

<210> 312

<211> 29

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (23)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 312

Ala	Phe	Met	Gln	Trp	Phe	Thr	Glu	Phe	Met	Glu	Leu	Phe	Leu	Ser	Val
1				5					10					15	

Trp	Glu	Leu	Ile	Lys	Thr	Xaa	Asn	Leu	Cys	Phe	Val	Cys
		20					25					

<210> 313

<211> 26

<212> PRT

<213> Homo sapiens

<400> 313

Arg	Ser	Gln	Thr	Pro	Thr	Gln	Ser	Trp	Val	Thr	Pro	Gln	Leu	Leu	Trp
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

SUBSTITUTE SHEET (RULE 26)

167
 1 5 10 15
 Arg Leu Gly Ser Gly Arg Leu Val Ala Gln
 20 25

 <210> 314
 <211> 39
 <212> PRT
 <213> Homo sapiens

 <400> 314
 Gly Ala Trp Gly Val Glu Val Val Ala Val Gly Ser Lys Ala Gly Cys
 1 5 10 15
 Leu Val Tyr Gln Leu Cys Asp Leu Lys Gln Ile Thr Phe Phe Phe Arg
 20 25 30
 Ala Ser Val Cys Leu Ser Val
 35

<210> 315
 <211> 194
 <212> PRT
 <213> Homo sapiens

 <220>
 <221> SITE
 <222> (61)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (95)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (116)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (129)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (131)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (132)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (163)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (187)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 315

Pro Ala Ser Leu Gly Ser Ser Trp Gly Gln Lys Leu Arg Gly Gly Thr
 1 5 10 15

Arg Lys Ser Phe Gln Glu Leu Ser Pro Ser Ser Ala Pro Pro Ala Cys
 20 25 30

Leu Pro Gln Pro Pro Ala Ser Thr Trp Leu Ser Ser Trp Pro Arg Pro
 35 40 45

Pro Cys Trp Pro Pro Met Cys Ser Trp Ala Leu Gly Xaa Cys Phe Cys
 50 55 60

Pro Ala Thr Gly Gln Trp Leu Pro Thr Ser Cys Cys Leu Trp Trp Cys
 65 70 75 80

Pro Asp Ala Gly Gly Arg Gln Lys His Phe Arg Ser Arg Trp Xaa Thr
 85 90 95

Ser Trp Glu Thr Trp Gln Pro Tyr Leu Thr Gly Leu Ile Ser Ser Val
 100 105 110

Leu Arg Ala Xaa Arg Pro Asp Ser Tyr Leu Gln Arg Phe Arg Ser Leu
 115 120 125

Xaa Gln Xaa Xaa Leu Cys Cys Ala Phe Val Ile Ala Leu Gly Gly Gly
 130 135 140

Cys Phe Leu Leu Thr Ala Leu Tyr Leu Glu Arg Asp Glu Thr Arg Ala
 145 150 155 160

Trp Gln Xaa Val Thr Gly Thr Pro Asp Ser Asn Asp Val Asp Ser Asn
 165 170 175

Asp Leu Glu Arg Gln Gly Leu Leu Ser Gly Xaa Gly Ala Ser Thr Glu
 180 185 190

Glu Pro

<210> 316

<211> 26

<212> PRT

<213> Homo sapiens

<400> 316

SUBSTITUTE SHEET (RULE 26)

169

Leu Arg Gly Gly Thr Arg Lys Ser Phe Gln Glu Leu Ser Pro Ser Ser
 1 5 10 15

Ala Pro Pro Ala Cys Leu Pro Gln Pro Pro
 20 25

<210> 317
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 317
 Ala Thr Gly Gln Trp Leu Pro Thr Ser Cys Cys Leu Trp Trp Cys Pro
 1 5 10 15

Asp Ala Gly Gly Arg Gln Lys His Phe Arg Ser Arg
 20 25

<210> 318
 <211> 22
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (21)
 <223> Xaa equals any of the naturally occurring L-amino acids

<400> 318
 Gly Gly Cys Phe Leu Leu Thr Ala Leu Tyr Leu Glu Arg Asp Glu Thr
 1 5 10 15

Arg Ala Trp Gln Xaa Val
 20

<210> 319
 <211> 124
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (38)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (72)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (76)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (93)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (105)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (106)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (107)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (108)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (109)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 319

Ala	Pro	His	Leu	Arg	Leu	Gln	Pro	Ala	Cys	His	Ser	Pro	Leu	Pro	Leu
1				5					10					15	

Pro	Gly	Ser	Arg	Pro	Gly	Pro	Asp	His	Pro	Ala	Gly	Leu	Leu	Cys	Val
			20					25					30		

Pro	Gly	Pro	Trp	Gly	Xaa	Ala	Ser	Val	Leu	Gln	Leu	Gly	Ser	Gly	Cys
		35					40					45			

Arg	His	Pro	Ala	Val	Cys	Gly	Gly	Ala	Gln	Met	Pro	Gly	Asp	Gly	Arg
	50					55					60				

Ser	Thr	Ser	Asp	His	Gly	Gly	Xaa	His	Pro	Gly	Xaa	Pro	Gly	Ser	Pro
65					70				75					80	

Ile	Ser	Gln	Asp	Leu	Ser	Leu	Val	Ser	Cys	Gly	Pro	Xaa	Ala	Leu	Thr
				85					90					95	

Pro	Ile	Cys	Ser	Ala	Ser	Ala	Ala	Xaa	Xaa	Xaa	Xaa	Xaa	Cys	Ala	Ala
			100					105					110		

Pro	Leu	Ser	Ser	Pro	Trp	Gly	Ala	Ala	Ala	Ser	Cys

SUBSTITUTE SHEET (RULE 26)

171

<210> 320
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 320
 Pro Ala Cys His Ser Pro Leu Pro Leu Pro Gly Ser Arg Pro Gly Pro
 1 5 10 15
 Asp His Pro Ala Gly Leu Leu Cys Val
 20 25

<210> 321
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 321
 Ser Gly Cys Arg His Pro Ala Val Cys Gly Gly Ala Gln Met Pro Gly
 1 5 10 15
 Asp Gly Arg Ser Thr Ser Asp His Gly Gly
 20 25

<210> 322
 <211> 95
 <212> PRT
 <213> Homo sapiens

<400> 322
 Gly Leu Lys Val Met Glu Ile Cys Ser Leu Thr Phe Leu Glu Ala Thr
 1 5 10 15
 Asn Leu Gln Ser Arg Cys Gln Gln Ala Met Leu Pro Leu Lys Ala Leu
 20 25 30
 Arg Lys Asn Pro Phe Leu Leu Leu Pro Ser Phe Asp Gly Cys Cys Gln
 35 40 45
 Ser Leu Ala Phe Pro Gly Leu Trp Leu Gln His Ser Asn Leu Cys Leu
 50 55 60
 Asn His His Met Thr Phe Leu Val Tyr Leu Leu Cys Val Ser Val Phe
 65 70 75 80
 Lys Tyr Phe Phe Pro Phe Ser Cys Thr Tyr Thr Ser His Trp Ile
 85 90 95

<210> 323
 <211> 22
 <212> PRT
 <213> Homo sapiens

<400> 323

SUBSTITUTE SHEET (RULE 26)

172

Ile Cys Ser Leu Thr Phe Leu Glu Ala Thr Asn Leu Gln Ser Arg Cys
 1 5 10 15

Gln Gln Ala Met Leu Pro
 20

<210> 324

<211> 26

<212> PRT

<213> Homo sapiens

<400> 324

Gly Leu Trp Leu Gln His Ser Asn Leu Cys Leu Asn His His Met Thr
 1 5 10 15

Phe Leu Val Tyr Leu Leu Cys Val Ser Val
 20 25

<210> 325

<211> 37

<212> PRT

<213> Homo sapiens

<400> 325

Pro Phe Pro Leu Leu Pro Pro Lys Arg Arg Gly Leu Leu Tyr His Leu
 1 5 10 15

Ile Gln Lys Ser Thr Leu Gly Leu Val Val Trp Phe Arg Glu His Leu
 20 25 30

Asp Ser Arg Ser Gln
 35

<210> 326

<211> 78

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (3)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (46)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (48)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

SUBSTITUTE SHEET (RULE 26)

<221> SITE

<222> (65)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 326

Arg	Gly	Xaa	Pro	Ser	Trp	Pro	Met	His	Thr	Leu	Val	Tyr	Ala	Gln	His
1				5					10					15	

Ser	Thr	Thr	His	Thr	Pro	Leu	Ile	Gln	Pro	Gln	Trp	Thr	Gln	Val	Ile
			20					25					30		

Asp	Gln	Pro	Pro	Gly	Ile	Thr	His	Gln	Phe	Cys	Val	Arg	Xaa	Cys	Xaa
		35					40					45			

Cys	Pro	Thr	Leu	Glu	Ser	Cys	Val	Gln	Glu	Cys	Val	Thr	Arg	Ser	Arg
	50					55						60			

Xaa	Lys	Pro	Thr	Thr	Gly	Val	Pro	Gly	Pro	Gln	Arg	Leu	Ala
65					70					75			

<210> 327

<211> 24

<212> PRT

<213> Homo sapiens

<400> 327

Thr	Pro	Leu	Ile	Gln	Pro	Gln	Trp	Thr	Gln	Val	Ile	Asp	Gln	Pro	Pro
1				5					10					15	

Gly	Ile	Thr	His	Gln	Phe	Cys	Val
			20				

<210> 328

<211> 104

<212> PRT

<213> Homo sapiens

<400> 328

Ala	Leu	Gly	Pro	Ser	Gln	Thr	Cys	Asp	Leu	Asp	Val	Trp	Leu	Val	Ala
1				5					10					15	

Lys	Pro	Ser	Phe	Phe	Arg	Gly	Pro	Gln	Gly	Ile	His	Tyr	Phe	Ser	Leu
			20					25					30		

Trp	Arg	Arg	Lys	Pro	Leu	Ser	His	Trp	Val	Ser	Ile	Trp	Gln	Leu	Gln
			35				40					45			

Gly	Gln	Glu	Thr	Met	Pro	Ala	Met	Leu	Arg	Ser	Arg	Pro	Ala	Gly	Gln
	50					55					60				

Ala	Thr	Val	Ala	Thr	Gly	Pro	Pro	Arg	Gly	Ser	Pro	Ser	Pro	Gln	Asp
65					70					75					80

Leu	Pro	Ser	Tyr	His	Arg	Lys	Gln	Val	Glu	Ser	Ser	His	Arg	His	Ser
				85					90					95	

Trp Glu Pro Ala Ser Gln Ser Gln
100

<210> 329
<211> 28
<212> PRT
<213> Homo sapiens

<400> 329
Cys Asp Leu Asp Val Trp Leu Val Ala Lys Pro Ser Phe Phe Arg Gly
1 5 10 15

Pro Gln Gly Ile His Tyr Phe Ser Leu Trp Arg Arg
20 25

<210> 330
<211> 28
<212> PRT
<213> Homo sapiens

<400> 330
Ala Gly Gln Ala Thr Val Ala Thr Gly Pro Pro Arg Gly Ser Pro Ser
1 5 10 15

Pro Gln Asp Leu Pro Ser Tyr His Arg Lys Gln Val
20 25

<210> 331
<211> 79
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (1)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (5)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (15)
<223> Xaa equals any of the naturally occurring L-amino acids

<400> 331
Xaa Gly Asp Thr Xaa Thr Gln Asn Ser Arg His Asp Thr Pro Xaa Leu
1 5 10 15

Ile Asp Tyr Tyr Arg Glu Ser Cys Thr Leu Gln Tyr Arg Pro Glu Phe
20 25 30

SUBSTITUTE SHEET (RULE 26)

Pro Gly Arg Pro Thr Arg Pro Arg Gly Ser Cys Pro Gln Tyr Pro Gly
 35 40 45

Pro Ala Ile Pro Arg Thr Ser Trp Ala Leu Gly Glu Gly Asp Ala Ala
 50 55 60

Pro Arg Gly Ala His His Pro Arg Arg Ala Asp Val Pro Leu Gly
 65 70 75

<210> 332

<211> 30

<212> PRT

<213> Homo sapiens

<400> 332

Tyr Arg Glu Ser Cys Thr Leu Gln Tyr Arg Pro Glu Phe Pro Gly Arg
 1 5 10 15

Pro Thr Arg Pro Arg Gly Ser Cys Pro Gln Tyr Pro Gly Pro
 20 25 30

<210> 333

<211> 155

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (72)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 333

Gly Lys Leu Tyr Ala Ala Val Pro Ser Gly Ile Pro Gly Ser Thr His
 1 5 10 15

Ala Ser Ala Arg Leu Met Pro Pro Val Ser Arg Ser Ser Tyr Ser Glu
 20 25 30

Asp Ile Val Gly Ser Arg Arg Arg Arg Arg Ser Ser Ser Gly Ser Pro
 35 40 45

Pro Ser Pro Gln Ser Arg Cys Ser Ser Trp Asp Gly Cys Ser Arg Ser
 50 55 60

His Ser Arg Gly Arg Glu Gly Xaa Arg Pro Pro Trp Ser Glu Leu Asp
 65 70 75 80

Val Gly Ala Leu Tyr Pro Phe Ser Arg Ser Gly Ser Arg Gly Arg Leu
 85 90 95

Pro Arg Phe Arg Asn Tyr Ala Phe Ala Ser Ser Trp Ser Thr Ser Tyr
 100 105 110

Ser Gly Tyr Arg Tyr His Arg Ala Leu Leu Cys Arg Arg Thr Ala Val

176

115 120 125
 Ser Gly Arg Leu Arg Glu Gly Arg Glu Pro Ser Ala Glu Glu Ala Glu
 130 135 140
 Gly Glu Arg Glu Asp Trp Gly Ile Gly Ser Ala
 145 150 155

<210> 334
 <211> 23
 <212> PRT
 <213> Homo sapiens

<400> 334
 Ser Gly Ile Pro Gly Ser Thr His Ala Ser Ala Arg Leu Met Pro Pro
 1 5 10 15

Val Ser Arg Ser Ser Tyr Ser
 20

<210> 335
 <211> 29
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (13)
 <223> Xaa equals any of the naturally occurring L-amino acids

<400> 335
 Gly Cys Ser Arg Ser His Ser Arg Gly Arg Glu Gly Xaa Arg Pro Pro
 1 5 10 15

Trp Ser Glu Leu Asp Val Gly Ala Leu Tyr Pro Phe Ser
 20 25

<210> 336
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 336
 Thr Ala Val Ser Gly Arg Leu Arg Glu Gly Arg Glu Pro Ser Ala Glu
 1 5 10 15

Glu Ala Glu Gly Glu Arg Glu Asp Trp
 20 25

<210> 337
 <211> 134
 <212> PRT
 <213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (17)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (77)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 337

Arg	Ile	Arg	Lys	Ala	Ala	Val	Gln	Ile	Pro	Thr	Arg	Lys	Asn	Ile	Gly
1				5					10					15	

Xaa	Arg	Arg	Pro	Val	Val	Gln	Glu	Thr	Arg	Lys	Lys	Glu	Arg	Ile	Ser
			20					25					30		

Arg	Leu	Lys	Glu	Ser	Ile	Gly	Asn	Ile	Leu	Ile	Val	Thr	Val	Thr	Gln
		35					40					45			

Ser	Leu	Thr	Gln	Ile	Leu	Thr	Leu	Met	Met	Ile	Lys	Arg	Glu	Leu	Lys
	50					55					60				

Pro	Arg	Arg	Lys	Arg	Arg	Lys	Arg	Asn	Thr	Lys	Gln	Xaa	Lys	Arg	Arg
65					70					75					80

Ile	Arg	Lys	Pro	Lys	Lys	Asn	Pro	Val	Thr	Gln	Ala	Val	Lys	Thr	Gln
				85					90					95	

Lys	Arg	Thr	Cys	Gln	Lys	Leu	Pro	Gly	Met	Glu	Gln	Pro	Asn	Val	Ala
			100					105					110		

Asp	Thr	Met	Asp	Leu	Ile	Gly	Pro	Glu	Ala	Pro	Ile	Asn	Thr	Tyr	Leu
		115					120						125		

Phe	Lys	Met	Lys	Asn	Leu
		130			

<210> 338

<211> 28

<212> PRT

<213> Homo sapiens

<400> 338

Thr	Arg	Lys	Lys	Glu	Arg	Ile	Ser	Arg	Leu	Lys	Glu	Ser	Ile	Gly	Asn
1				5					10					15	

Ile	Leu	Ile	Val	Thr	Val	Thr	Gln	Ser	Leu	Thr	Gln
			20				25				

<210> 339

<211> 28

<212> PRT

<213> Homo sapiens

178

<400> 339

Val Lys Thr Gln Lys Arg Thr Cys Gln Lys Leu Pro Gly Met Glu Gln
 1 5 10 15

Pro Asn Val Ala Asp Thr Met Asp Leu Ile Gly Pro
 20 25

<210> 340

<211> 80

<212> PRT

<213> Homo sapiens

<400> 340

Leu Pro Phe Thr Leu Lys Pro Lys Met Val Lys Ile Pro Phe Ser Ser
 1 5 10 15

Arg Leu Ile Asn Asn Asn Leu Gln Tyr Ile Asp Cys Ile Leu Ser Leu
 20 25 30

Lys Arg Cys Glu Glu Ile Leu Leu Met Trp His Gly Leu Leu Leu Cys
 35 40 45

Leu Ala Ser Val Phe Leu Glu Leu Arg Gly Asp Arg Pro Pro Leu Leu
 50 55 60

Ala Ser Leu Leu Glu Pro His Lys Met Pro Leu His Ser Ser Ser Leu
 65 70 75 80

<210> 341

<211> 24

<212> PRT

<213> Homo sapiens

<400> 341

Leu Lys Pro Lys Met Val Lys Ile Pro Phe Ser Ser Arg Leu Ile Asn
 1 5 10 15

Asn Asn Leu Gln Tyr Ile Asp Cys
 20

<210> 342

<211> 23

<212> PRT

<213> Homo sapiens

<400> 342

Ser Leu Lys Arg Cys Glu Glu Ile Leu Leu Met Trp His Gly Leu Leu
 1 5 10 15

Leu Cys Leu Ala Ser Val Phe

SUBSTITUTE SHEET (RULE 26)

20

<210> 343

<211> 21

<212> PRT

<213> Homo sapiens

<400> 343

Leu Arg Gly Asp Arg Pro Pro Leu Leu Ala Ser Leu Leu Glu Pro His
 1 5 10 15

Lys Met Pro Leu His
 20

<210> 344

<211> 79

<212> PRT

<213> Homo sapiens

<400> 344

Leu Gln Met His Thr Gly Ser Gly Phe Lys Gly Lys Ser Cys Glu Val
 1 5 10 15

Ala Phe Tyr Val Ala Gln Ala Glu Lys Pro Gly Glu Gly Ala Tyr Leu
 20 25 30

His Gly Ala Gln Glu Thr Gln Lys Gln Gly Ile Glu Ala Asp His Ala
 35 40 45

Thr Leu Arg Gly Ser Pro His Ser Val Ser Lys Thr Lys Tyr Asn Leu
 50 55 60

Tyr Ile Ala Asn Tyr Tyr Leu Leu Ala Trp Arg Lys Met Glu Ser
 65 70 75

<210> 345

<211> 20

<212> PRT

<213> Homo sapiens

<400> 345

Cys Glu Val Ala Phe Tyr Val Ala Gln Ala Glu Lys Pro Gly Glu Gly
 1 5 10 15

Ala Tyr Leu His
 20

<210> 346

<211> 23

<212> PRT

<213> Homo sapiens

<400> 346

SUBSTITUTE SHEET (RULE 26)

180

Ala Thr Leu Arg Gly Ser Pro His Ser Val Ser Lys Thr Lys Tyr Asn
 1 5 10 15

Leu Tyr Ile Ala Asn Tyr Tyr
 20

<210> 347

<211> 65

<212> PRT

<213> Homo sapiens

<400> 347

Leu Ser Ala Ser Leu Leu Asp Arg Tyr Pro Ala Ser Glu Ser Asn Asn
 1 5 10 15

Tyr Ile Phe Asn Phe Val Leu Tyr Met Leu His Phe Leu Ala Gly Thr
 20 25 30

Leu Phe Ser Leu Phe Pro Asp Phe Glu Leu Ser Pro Arg Ser Ala Thr
 35 40 45

Leu Phe Pro Asp Leu Arg Thr Val Gln Leu Leu Ser Ser Arg Pro His
 50 55 60

Leu

65

<210> 348

<211> 23

<212> PRT

<213> Homo sapiens

<400> 348

Leu Leu Asp Arg Tyr Pro Ala Ser Glu Ser Asn Asn Tyr Ile Phe Asn
 1 5 10 15

Phe Val Leu Tyr Met Leu His
 20

<210> 349

<211> 20

<212> PRT

<213> Homo sapiens

<400> 349

Phe Pro Asp Phe Glu Leu Ser Pro Arg Ser Ala Thr Leu Phe Pro Asp
 1 5 10 15

Leu Arg Thr Val
 20

<210> 350

<211> 85

SUBSTITUTE SHEET (RULE 26)

181

<212> PRT

<213> Homo sapiens

<400> 350

Asn Gly Gly Phe Tyr Asp Val Ser Phe Lys Gln Ala Gly Leu Ile Glu
 1 5 10 15

Phe Leu Cys Ile Ile Tyr Phe Tyr Pro Met Ala His Val Ile Cys Gly
 20 25 30

Ser Arg Phe Thr Ile Val Arg Thr Ile Pro Val His Tyr Val Gly Glu
 35 40 45

Tyr Phe Ile Lys Ser Ser Ile Trp Ile Leu Tyr Arg Ile Asn Glu Arg
 50 55 60

Thr Ala Thr Lys Lys Ala Ala Ser Asp Phe Gln Lys Asn Phe Arg Cys
 65 70 75 80

Phe Leu Asp Ala Phe
 85

<210> 351

<211> 19

<212> PRT

<213> Homo sapiens

<400> 351

Lys Gln Ala Gly Leu Ile Glu Phe Leu Cys Ile Ile Tyr Phe Tyr Pro
 1 5 10 15

Met Ala His

<210> 352

<211> 23

<212> PRT

<213> Homo sapiens

<400> 352

Tyr Phe Ile Lys Ser Ser Ile Trp Ile Leu Tyr Arg Ile Asn Glu Arg
 1 5 10 15

Thr Ala Thr Lys Lys Ala Ala
 20

<210> 353

<211> 22

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (4)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (7)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (9)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 353

Ser	Pro	Arg	Xaa	Gly	Arg	Xaa	Phe	Xaa	Thr	Ser	Arg	Lys	Gln	Ile	Ser
1				5					10					15	

Gly	Phe	Leu	Glu	Phe	Asp
		20			

<210> 354

<211> 56

<212> PRT

<213> Homo sapiens

<400> 354

Met	Lys	His	Ala	Ala	Phe	Gly	Leu	Ile	Pro	Leu	Val	Lys	Glu	Ile	Tyr
1				5					10					15	

Arg	Tyr	Leu	Lys	Ile	Lys	Ser	Lys	Leu	Leu	Ile	Gly	Ser	Gly	Lys	Cys
		20						25					30		

Gln	Leu	Gln	Pro	Glu	Trp	Leu	Gln	Thr	Ser	Leu	Ile	Asn	Ser	Ser	Leu
		35					40						45		

Leu	Met	Asp	Trp	Leu	Thr	Pro	Tyr
	50					55	

<210> 355

<211> 29

<212> PRT

<213> Homo sapiens

<400> 355

Ile	Tyr	Arg	Tyr	Leu	Lys	Ile	Lys	Ser	Lys	Leu	Leu	Ile	Gly	Ser	Gly
1				5					10					15	

Lys	Cys	Gln	Leu	Gln	Pro	Glu	Trp	Leu	Gln	Thr	Ser	Leu
		20						25				

<210> 356

<211> 68

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

183

<400> 356

Gln Leu Gly Leu Pro Trp Asp Gln Ser Lys Gly Pro Arg Lys Asn Gly
 1 5 10 15

Leu Ser Met Cys Gly Ser Val Tyr Ser Thr Ile Trp Ser Leu Ile Ala
 20 25 30

Ser Arg Arg Glu Glu Thr Ile Arg Val Ile Val Leu Tyr Ile Gln Ser
 35 40 45

Pro Asn Ile Asn Thr Arg His Ile Ser Lys Arg Gly Leu Asn Lys Ala
 50 55 60

Leu Thr Asn Pro
 65

<210> 357

<211> 21

<212> PRT

<213> Homo sapiens

<400> 357

Ser Lys Gly Pro Arg Lys Asn Gly Leu Ser Met Cys Gly Ser Val Tyr
 1 5 10 15

Ser Thr Ile Trp Ser
 20

<210> 358

<211> 17

<212> PRT

<213> Homo sapiens

<400> 358

Gln Ser Pro Asn Ile Asn Thr Arg His Ile Ser Lys Arg Gly Leu Asn
 1 5 10 15

Lys

<210> 359

<211> 19

<212> PRT

<213> Homo sapiens

<400> 359

His Pro Gln Thr Ser Ala Gly Gly Phe Pro Leu His Gln Gly Leu Pro
 1 5 10 15

Thr Val Ser

<210> 360

184

<211> 117
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (110)
 <223> Xaa equals any of the naturally occurring L-amino acids

<400> 360
 Pro Ser Trp Phe Pro Glu Leu Ser Pro Trp Pro Leu Lys Thr Leu Lys
 1 5 10 15
 Lys Arg Arg Gln Met Arg Leu Arg Arg Arg Gly Arg Leu Cys Arg Leu
 20 25 30
 Ser Pro Ala Thr Thr Thr Thr Ala Asp Thr Cys Arg Cys Pro Ala Arg
 35 40 45
 Ser Tyr Arg Gly Ser Gly Arg Arg Pro Ala Cys Ala Gln Asp Ser Pro
 50 55 60
 Ala Pro Pro Ser Arg Pro Thr Arg Arg Ala Trp Glu Lys Cys Ala Leu
 65 70 75 80
 Arg Pro Lys Arg Ala Ala Gln Trp Ser Thr Gly Val Pro Pro Ser Pro
 85 90 95
 Arg Ser Ser Thr Thr Gly Cys Cys Phe Gly Thr Ala Ala Xaa Cys Ala
 100 105 110
 Glu Gly Ala Arg Arg
 115

<210> 361
 <211> 22
 <212> PRT
 <213> Homo sapiens

<400> 361
 Thr Thr Thr Ala Asp Thr Cys Arg Cys Pro Ala Arg Ser Tyr Arg Gly
 1 5 10 15
 Ser Gly Arg Arg Pro Ala
 20

<210> 362
 <211> 24
 <212> PRT
 <213> Homo sapiens

<400> 362
 Pro Ser Arg Pro Thr Arg Arg Ala Trp Glu Lys Cys Ala Leu Arg Pro
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

185

Lys Arg Ala Ala Gln Trp Ser Thr
20

<210> 363
<211> 20
<212> PRT
<213> Homo sapiens

<400> 363
Ala Arg Gly Val Leu Asn Leu Arg Asn Arg Phe Glu Cys Phe Ser Ile
1 5 10 15

Ile Glu Thr Val
20

<210> 364
<211> 69
<212> PRT
<213> Homo sapiens

<400> 364
Ile Gly Gln Leu Val Met Lys Ser Ile Cys His Phe Gln Arg Leu Leu
1 5 10 15

Ser Val Ala Ile Asp Phe Ala Ser Gln Phe Leu Lys Asn Tyr Ile Phe
20 25 30

Ser Ser Thr His Ser Ser Lys Ala Gly Phe Ser Val Val Cys Ser Leu
35 40 45

Pro Lys Trp Leu Tyr Thr Asp Gly Met Glu Met Val Leu Lys Ile Thr
50 55 60

His Lys Leu Ser Phe
65

<210> 365
<211> 24
<212> PRT
<213> Homo sapiens

<400> 365
Gln Arg Leu Leu Ser Val Ala Ile Asp Phe Ala Ser Gln Phe Leu Lys
1 5 10 15

Asn Tyr Ile Phe Ser Ser Thr His
20

<210> 366
<211> 12
<212> PRT
<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

186

<400> 366

Leu Met Lys Thr Ala Ser Arg Met Leu Leu Leu Glu
 1 5 10

<210> 367

<211> 25

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (3)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (6)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 367

Ala Thr Xaa Trp Asp Xaa Pro Gly Cys Arg Asn Ser Ala Arg Gly Glu
 1 5 10 15

Arg Leu His Val Gly Asp Ala Pro Trp
 20 25

<210> 368

<211> 109

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (102)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (105)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 368

Ala Arg Asp Glu Arg Arg Glu Val Leu Lys Thr Leu Met Arg Leu Ser
 1 5 10 15

Thr Gln Arg Pro Gln Ala Phe Leu Pro Ser Gln Ser Trp Phe Val Arg
 20 25 30

Leu Gln Lys Ala Gly Glu Gly Ala Leu Lys Gln Glu Asn Ser Leu Thr
 35 40 45

Ile Gln Asn Cys Leu Leu Cys Leu Pro Arg Val His Arg Gln Arg Pro
 50 55 60

Thr Pro Pro Gln Pro Gln Arg Gly Asn Thr Glu Ala Ser Val Leu Gln

SUBSTITUTE SHEET (RULE 26)

187
65 70 75 80
Thr Ser Thr Glu His Leu Pro Arg Ala Ala Val Leu Leu Val Pro Asn
85 90 95
Ser Cys Ser Pro Gly Xaa Pro Thr Xaa Leu Leu Ser Ser
100 105

<210> 369

<211> 22

<212> PRT

<213> Homo sapiens

<400> 369

Glu Arg Arg Glu Val Leu Lys Thr Leu Met Arg Leu Ser Thr Gln Arg
1 5 10 15

Pro Gln Ala Phe Leu Pro
20

<210> 370

<211> 25

<212> PRT

<213> Homo sapiens

<400> 370

Gly Ala Leu Lys Gln Glu Asn Ser Leu Thr Ile Gln Asn Cys Leu Leu
1 5 10 15

Cys Leu Pro Arg Val His Arg Gln Arg
20 25

<210> 371

<211> 21

<212> PRT

<213> Homo sapiens

<400> 371

Ser Val Leu Gln Thr Ser Thr Glu His Leu Pro Arg Ala Ala Val Leu
1 5 10 15

Leu Val Pro Asn Ser
20

<210> 372

<211> 9

<212> PRT

<213> Homo sapiens

<400> 372

Ala Leu Val Ile Ser Asn Pro Leu Leu
1 5

SUBSTITUTE SHEET (RULE 26)

<210> 373
 <211> 63
 <212> PRT
 <213> Homo sapiens

<400> 373
 Pro Tyr Ile Asn Thr Gln Met Cys Val Ser Ser Arg Asn Lys Phe Cys
 1 5 10 15
 Ile Ser Gly His Gln Lys Tyr Asp Ser His Gly Arg Glu Thr Arg Phe
 20 25 30
 Glu Met His Lys Ala Arg Ala Ser Ser Trp Lys Asn Ile Leu Lys Ile
 35 40 45
 Arg Ser Leu Lys Ile Ile Ser Arg Gly Phe Glu Ile Thr Asn Ala
 50 55 60

<210> 374
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 374
 Lys Phe Cys Ile Ser Gly His Gln Lys Tyr Asp Ser His Gly Arg Glu
 1 5 10 15
 Thr Arg Phe Glu Met His Lys Ala Arg Ala Ser
 20 25

<210> 375
 <211> 84
 <212> PRT
 <213> Homo sapiens

<400> 375
 His Thr Leu Leu Glu Ile Ala Asn Pro Leu Gln Ala Ala Val Leu Gly
 1 5 10 15
 Ala Ser Ser Ile His Pro Ser Ile His Thr Ser Thr His Leu Met Phe
 20 25 30
 Met Gly Leu Lys Trp Thr Glu Leu His His Ser Pro Asp Ser Val Gln
 35 40 45
 Gly Ala Gly Ala Ala Glu Ala Ala Gln Thr Arg His Ser Leu Arg Pro
 50 55 60
 Gly Arg Gly Arg Glu Arg His Asp Cys Thr Leu Lys Asn Leu Thr Leu
 65 70 75 80
 Phe Ile Ile Cys

SUBSTITUTE SHEET (RULE 26)

<210> 376
 <211> 22
 <212> PRT
 <213> Homo sapiens

<400> 376
 Asn Pro Leu Gln Ala Ala Val Leu Gly Ala Ser Ser Ile His Pro Ser
 1 5 10 15
 Ile His Thr Ser Thr His
 20

<210> 377
 <211> 17
 <212> PRT
 <213> Homo sapiens

<400> 377
 Ser Leu Arg Pro Gly Arg Gly Arg Glu Arg His Asp Cys Thr Leu Lys
 1 5 10 15

Asn

<210> 378
 <211> 52
 <212> PRT
 <213> Homo sapiens

<400> 378
 Ala Glu Asn Val His Cys Thr Pro Ala Trp Glu Thr Gly Arg Asp Ser
 1 5 10 15

Glu Asp Gly Lys Gly Arg Glu Gly Met Gly Arg Asp Arg Lys Gly Trp
 20 25 30

Asp Gly Thr Gly Leu Asp Gly Thr Gly Trp Glu Gly Lys Arg Glu Arg
 35 40 45

Asn Val Pro Ala
 50

<210> 379
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 379
 Gly Arg Asp Ser Glu Asp Gly Lys Gly Arg Glu Gly Met Gly Arg Asp
 1 5 10 15

Arg Lys Gly Trp Asp Gly Thr Gly Leu Asp
 20 25

SUBSTITUTE SHEET (RULE 26)

<210> 380

<211> 14

<212> PRT

<213> Homo sapiens

<400> 380

Thr Ser Leu Gly Asp Leu Trp Asp Tyr Asn Asn Ser Ser His
 1 5 10

<210> 381

<211> 66

<212> PRT

<213> Homo sapiens

<400> 381

Asp Arg Arg Ile Ile Arg Thr Arg Glu Ala Ala Val Ala Val Ser Arg
 1 5 10 15

Glu Arg Pro Leu His Ser Ser Leu Gly Asn Arg Glu Arg Leu Arg Arg
 20 25 30

Trp Glu Gly Thr Gly Arg Asp Gly Lys Gly Gln Glu Gly Met Gly Arg
 35 40 45

Asp Gly Thr Gly Trp Asp Gly Met Gly Arg Glu Glu Arg Lys Lys Cys
 50 55 60

Pro Ser
 65

<210> 382

<211> 25

<212> PRT

<213> Homo sapiens

<400> 382

Arg Pro Leu His Ser Ser Leu Gly Asn Arg Glu Arg Leu Arg Arg Trp
 1 5 10 15

Glu Gly Thr Gly Arg Asp Gly Lys Gly
 20 25

<210> 383

<211> 9

<212> PRT

<213> Homo sapiens

<400> 383

Asn Gln Ser Trp Gly Pro Met Gly Leu
 1 5

SUBSTITUTE SHEET (RULE 26)

191

<210> 384

<211> 59

<212> PRT

<213> Homo sapiens

<400> 384

Gly Gly Gly Gly Cys Ser Glu Pro Arg Thr Ser Ile Ala Leu Gln Pro
 1 5 10 15

Gly Lys Gln Gly Glu Thr Pro Lys Met Gly Arg Asp Gly Lys Gly Trp
 20 25 30

Glu Gly Thr Gly Arg Asp Gly Thr Gly Arg Asp Trp Met Gly Arg Asp
 35 40 45

Gly Lys Gly Arg Glu Lys Glu Met Ser Gln Gln
 50 55

<210> 385

<211> 24

<212> PRT

<213> Homo sapiens

<400> 385

Lys Gln Gly Glu Thr Pro Lys Met Gly Arg Asp Gly Lys Gly Trp Glu
 1 5 10 15

Gly Thr Gly Arg Asp Gly Thr Gly
 20

<210> 386

<211> 32

<212> PRT

<213> Homo sapiens

<400> 386

Pro Val Leu Gly Thr Tyr Gly Thr Ile Thr Thr Pro Val Thr Glu Leu
 1 5 10 15

Thr Lys Gly Gln Glu Lys Glu Gly Gly Val Glu Thr Val Leu Tyr Glu
 20 25 30

<210> 387

<211> 11

<212> PRT

<213> Homo sapiens

<400> 387

Lys Ile Val Phe Ile Asp Gln Lys Trp Ser Lys
 1 5 10

<210> 388
 <211> 70
 <212> PRT
 <213> Homo sapiens

<400> 388
 Cys Ser Leu Phe Trp Gly Ile Leu Phe Leu Ser Arg Leu Arg Ile His
 1 5 10 15
 Leu Phe Leu Ser Leu Lys Pro Cys Met Cys Leu Arg Pro Ile Asp Ile
 20 25 30
 Leu Ser His Phe Leu Asp Ile Phe Val Thr Ser Val Leu Ser Glu Leu
 35 40 45
 Glu Lys Ser Ser Leu Lys Thr Thr Glu Thr Phe Ser Phe Ala Val Phe
 50 55 60
 Leu Leu Leu Met Met Asn
 65 70

<210> 389
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 389
 Leu Ser Arg Leu Arg Ile His Leu Phe Leu Ser Leu Lys Pro Cys Met
 1 5 10 15
 Cys Leu Arg Pro Ile Asp Ile Leu Ser His
 20 25

<210> 390
 <211> 22
 <212> PRT
 <213> Homo sapiens

<400> 390
 Val Leu Ser Glu Leu Glu Lys Ser Ser Leu Lys Thr Thr Glu Thr Phe
 1 5 10 15
 Ser Phe Ala Val Phe Leu
 20

<210> 391
 <211> 8
 <212> PRT
 <213> Homo sapiens

<400> 391
 Thr Leu Phe Arg Tyr Ile Leu His
 1 5

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<210> 392
 <211> 14
 <212> PRT
 <213> Homo sapiens

<400> 392
 Gly Thr Ser Phe Ser Val Leu Ser Leu Ile His Asp Thr Gly
 1 5 10

<210> 393
 <211> 63
 <212> PRT
 <213> Homo sapiens

<400> 393
 Val Leu Ile Ser Ala Ser Thr Ile Gly Ser Arg Thr Ser Gly Ala Gln
 1 5 10 15
 Gly Met Glu Lys Met Thr Ile Pro Thr Leu Ala Val Gly Glu Pro Lys
 20 25 30
 Thr Pro Glu Lys Ser Lys Cys Ser Leu Lys Gln Cys Phe Ser Ser Cys
 35 40 45
 Asn Val His Ile Asp His Leu Gly Leu Leu Leu Lys Cys Lys Phe
 50 55 60

<210> 394
 <211> 23
 <212> PRT
 <213> Homo sapiens

<400> 394
 Ala Ser Thr Ile Gly Ser Arg Thr Ser Gly Ala Gln Gly Met Glu Lys
 1 5 10 15
 Met Thr Ile Pro Thr Leu Ala
 20

<210> 395
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 395
 Gly Glu Pro Lys Thr Pro Glu Lys Ser Lys Cys Ser Leu Lys Gln Cys
 1 5 10 15
 Phe Ser Ser Cys Asn Val His Ile Asp His Leu
 20 25

SUBSTITUTE SHEET (RULE 26)

194

<210> 396

<211> 101

<212> PRT

<213> Homo sapiens

<400> 396

Arg Ile Arg Ser Gln Asp Leu Ala Ile Met Thr Thr Cys Phe Lys Lys
 1 5 10 15

Tyr Glu Phe Ser Phe Phe Val Leu Gly Phe Leu Arg Arg Trp Gly Ala
 20 25 30

Thr Leu Cys Leu Gly Phe Thr Ser Phe Ala Ile Lys Phe His Pro Ser
 35 40 45

Ser Leu Cys Ser Glu Lys Glu Gly Lys Asp Phe Ser Gly Phe Ala Leu
 50 55 60

Ser Ile His Gly Pro Glu Arg Lys Lys Glu Glu Gly Trp Ala Arg Trp
 65 70 75 80

Leu Thr Pro Val Val Pro Val Leu Trp Glu Ala Glu Val Gly Gly Ser
 85 90 95

Pro Glu Val Ser Ser
 100

<210> 397

<211> 22

<212> PRT

<213> Homo sapiens

<400> 397

Thr Thr Cys Phe Lys Lys Tyr Glu Phe Ser Phe Phe Val Leu Gly Phe
 1 5 10 15

Leu Arg Arg Trp Gly Ala
 20

<210> 398

<211> 26

<212> PRT

<213> Homo sapiens

<400> 398

Ser Glu Lys Glu Gly Lys Asp Phe Ser Gly Phe Ala Leu Ser Ile His
 1 5 10 15

Gly Pro Glu Arg Lys Lys Glu Glu Gly Trp
 20 25

<210> 399

<211> 86

<212> PRT

SUBSTITUTE SHEET (RULE 26)

195

<213> Homo sapiens

<400> 399

Met Asn Glu Cys Ile Ala Lys Pro Cys Met Ala Ala Phe Cys Ser Cys
 1 5 10 15

Pro Ser Cys Cys Leu Pro Ser Arg Pro Gly Cys Ser Arg Glu Gln Arg
 20 25 30

Cys Ala Phe Ser Cys Glu Pro Cys His Thr Val Glu His Trp Val Glu
 35 40 45

Pro Met Gly Gln Gly Gln Arg Gln Glu His Thr Gln Gly Ser Val Leu
 50 55 60

Pro Ser Ser His Pro Ser Arg Gly Lys Ala Thr Thr Val His Ser Cys
 65 70 75 80

Cys Gln Glu Pro Trp Gly
 85

<210> 400

<211> 27

<212> PRT

<213> Homo sapiens

<400> 400

Phe Cys Ser Cys Pro Ser Cys Cys Leu Pro Ser Arg Pro Gly Cys Ser
 1 5 10 15

Arg Glu Gln Arg Cys Ala Phe Ser Cys Glu Pro
 20 25

<210> 401

<211> 23

<212> PRT

<213> Homo sapiens

<400> 401

Gly Gln Arg Gln Glu His Thr Gln Gly Ser Val Leu Pro Ser Ser His
 1 5 10 15

Pro Ser Arg Gly Lys Ala Thr
 20

<210> 402

<211> 139

<212> PRT

<213> Homo sapiens

<400> 402

Gly Val Val Asn Ser Cys Leu Leu Pro Leu Pro Pro Arg Leu Leu Ala
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

196

Thr Gly Met Asp Cys Gly Gly Phe Ala Ser Arg Arg Met Gly Gly Arg
 20 25 30
 Gln His Ala Ala Leu Ser Val Phe Leu Pro Leu Pro Leu Ala His Gly
 35 40 45
 Leu Tyr Pro Met Phe Asn Cys Val Ala Gly Leu Thr Gly Lys Gly Thr
 50 55 60
 Ser Leu Leu Ser Gly Ala Ala Arg Pro Ala Gly Glu Ala Ala Ala Arg
 65 70 75 80
 Ala Gly Thr Lys Gly Ser His Ala Arg Phe Gly Asn Ala Phe Ile His
 85 90 95
 Ser Phe Ile His Ser Phe Ile Glu Cys Leu Leu Asn Thr Tyr Cys Val
 100 105 110
 Pro Ser Ser Ala Leu Thr Ala Val Gly Ile Gly Asp Ile Leu Lys Asn
 115 120 125
 Lys Asn Asp Lys Ser Ser Cys Leu Cys Ser Cys
 130 135

<210> 403

<211> 25

<212> PRT

<213> Homo sapiens

<400> 403

Gly Met Asp Cys Gly Gly Phe Ala Ser Arg Arg Met Gly Gly Arg Gln
 1 5 10 15

His Ala Ala Leu Ser Val Phe Leu Pro
 20 25

<210> 404

<211> 25

<212> PRT

<213> Homo sapiens

<400> 404

Leu Thr Gly Lys Gly Thr Ser Leu Leu Ser Gly Ala Ala Arg Pro Ala
 1 5 10 15

Gly Glu Ala Ala Ala Arg Ala Gly Thr
 20 25

<210> 405

<211> 22

<212> PRT

<213> Homo sapiens

<400> 405

SUBSTITUTE SHEET (RULE 26)

197

Leu Asn Thr Tyr Cys Val Pro Ser Ser Ala Leu Thr Ala Val Gly Ile
 1 5 10 15

Gly Asp Ile Leu Lys Asn
 20

<210> 406

<211> 55

<212> PRT

<213> Homo sapiens

<400> 406

Thr Ser Leu Ser Gln Leu Trp His Phe Cys His Phe Trp Pro Val Lys
 1 5 10 15

Phe Cys Cys Gly Gly Cys Pro Val His Cys Arg Met Phe Ser Ser Ile
 20 25 30

Ser Gly Leu Tyr Leu Leu Asn Ala Ser Ala Pro Ser Leu Gln Leu Asn
 35 40 45

Asp Pro Lys Cys Leu Gln Thr
 50 55

<210> 407

<211> 28

<212> PRT

<213> Homo sapiens

<400> 407

Trp Pro Val Lys Phe Cys Cys Gly Gly Cys Pro Val His Cys Arg Met
 1 5 10 15

Phe Ser Ser Ile Ser Gly Leu Tyr Leu Leu Asn Ala
 20 25

<210> 408

<211> 20

<212> PRT

<213> Homo sapiens

<400> 408

Ser Cys Arg Cys Trp Ala Leu Gly Ala Gly Gly Gly Gln Arg Gln Trp
 1 5 10 15

Val Gly Arg Ser
 20

<210> 409

<211> 80

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

198

<400> 409

Thr Gly Ala Gln Ala Pro Lys Met Gly Ala Arg Gln Arg Lys Arg Pro
 1 5 10 15

Leu Gln Thr Arg Ile Lys Asn Ser Ser Lys Ser Thr Leu Trp Pro Pro
 20 25 30

Gln Trp Val Arg Cys Gly Arg Trp Trp Thr Trp Pro Ser Arg Lys Lys
 35 40 45

Thr Ser Arg Pro Arg Arg Gln Leu Phe Thr Ser Thr Leu Ser Thr Ser
 50 55 60

Ala Ser Ala Leu Val Trp Pro Val Ser Trp Phe Ser Gln Glu Gly His
 65 70 75 80

<210> 410

<211> 25

<212> PRT

<213> Homo sapiens

<400> 410

Met Gly Ala Arg Gln Arg Lys Arg Pro Leu Gln Thr Arg Ile Lys Asn
 1 5 10 15

Ser Ser Lys Ser Thr Leu Trp Pro Pro
 20 25

<210> 411

<211> 23

<212> PRT

<213> Homo sapiens

<400> 411

Pro Arg Arg Gln Leu Phe Thr Ser Thr Leu Ser Thr Ser Ala Ser Ala
 1 5 10 15

Leu Val Trp Pro Val Ser Trp
 20

<210> 412

<211> 25

<212> PRT

<213> Homo sapiens

<400> 412

Asp Gly Gly Gly Lys Glu Glu Gly Val Ser Cys Leu Lys Ile Ser Leu
 1 5 10 15

Leu Cys Gly Pro Trp Leu Trp Leu Pro
 20 25

SUBSTITUTE SHEET (RULE 26)

<210> 413
 <211> 135
 <212> PRT
 <213> Homo sapiens

<400> 413
 His Glu Met Gly Glu Leu Ala Ile Cys His Thr Arg Val Pro Phe Ser
 1 5 10 15
 Leu Pro Ser Ser Ala Gln Gly Val Pro Gln Asn Leu Gln Gly Pro Ile
 20 25 30
 Gly His Leu Ala Val Cys Thr Pro Ser Ser Leu Thr Ser Trp His Phe
 35 40 45
 Pro Gln Lys Arg Glu Lys Trp Ser Thr Val Asn Lys Arg Gln Arg Phe
 50 55 60
 Leu Gln Phe Pro Ala Pro Leu Arg Asn Trp Ile Pro Gln Thr Pro Leu
 65 70 75 80
 Ser Leu Ser Val Ser Ser Gly Pro Leu Gly Ser Phe Thr Val Phe Thr
 85 90 95
 Leu Leu Ser Leu Cys Ala Trp Pro Trp Cys Cys Arg Asp Cys Tyr Lys
 100 105 110
 Ser Cys Cys Pro Ile Pro Ile Phe Asn Leu Thr Ala Pro Leu Cys Val
 115 120 125
 His Thr Pro Glu Pro Ser Ser
 130 135

<210> 414
 <211> 23
 <212> PRT
 <213> Homo sapiens

<400> 414
 Ser Ser Ala Gln Gly Val Pro Gln Asn Leu Gln Gly Pro Ile Gly His
 1 5 10 15
 Leu Ala Val Cys Thr Pro Ser
 20

<210> 415
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 415
 Val Asn Lys Arg Gln Arg Phe Leu Gln Phe Pro Ala Pro Leu Arg Asn
 1 5 10 15

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200

Trp Ile Pro Gln Thr Pro Leu Ser Leu Ser Val Ser
 20 25

<210> 416

<211> 23

<212> PRT

<213> Homo sapiens

<400> 416

Cys Cys Arg Asp Cys Tyr Lys Ser Cys Cys Pro Ile Pro Ile Phe Asn
 1 5 10 15

Leu Thr Ala Pro Leu Cys Val
 20

<210> 417

<211> 150

<212> PRT

<213> Homo sapiens

<400> 417

Asp Leu Asn Val Thr Asn Glu Gly Glu Gly Lys Glu Val Leu Gly Gln
 1 5 10 15

Gly Ser Thr Asn Asn Glu Lys Lys Cys Gln Lys Ala Thr Ser Asn Thr
 20 25 30

Glu Pro Arg Ala Arg Glu Ala Lys Ala Arg His Ala Asn Met Gly Thr
 35 40 45

Ser Asp Arg Glu Ser Pro Thr Trp Ser Leu Thr Ala Glu Gly Leu Lys
 50 55 60

Ala Lys Ser Lys Met Gln Gly Lys Ala Thr Lys Gly Ala Ala Ser Thr
 65 70 75 80

Met Gly Ser His Asn Gln Gly Pro His Lys Arg Glu Ile Phe Lys His
 85 90 95

Glu Thr Pro Ser Ser Phe Pro Pro Pro Ser Gln Cys Gln Pro Glu Leu
 100 105 110

Leu Pro Tyr Lys Tyr Trp Ala Thr Leu Ala Ser Gly Tyr Val Pro Ser
 115 120 125

Trp Leu Pro Ser Val Asp Ser Tyr Arg Ile Asn Thr Ala Ile Lys Asp
 130 135 140

Lys Asn Gly Gln Asp Thr
 145 150

<210> 418

<211> 24

SUBSTITUTE SHEET (RULE 26)

201

<212> PRT

<213> Homo sapiens

<400> 418

Val Leu Gly Gln Gly Ser Thr Asn Asn Glu Lys Lys Cys Gln Lys Ala
1 5 10 15

Thr Ser Asn Thr Glu Pro Arg Ala
20

<210> 419

<211> 29

<212> PRT

<213> Homo sapiens

<400> 419

Arg Glu Ser Pro Thr Trp Ser Leu Thr Ala Glu Gly Leu Lys Ala Lys
1 5 10 15

Ser Lys Met Gln Gly Lys Ala Thr Lys Gly Ala Ala Ser
20 25

<210> 420

<211> 22

<212> PRT

<213> Homo sapiens

<400> 420

Gly Tyr Val Pro Ser Trp Leu Pro Ser Val Asp Ser Tyr Arg Ile Asn
1 5 10 15

Thr Ala Ile Lys Asp Lys
20

<210> 421

<211> 12

<212> PRT

<213> Homo sapiens

<400> 421

Asn Ser Ala Glu Gln Ser Met Leu Ile Leu Val Thr
1 5 10

<210> 422

<211> 122

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (2)

<223> Xaa equals any of the naturally occurring L-amino acids

SUBSTITUTE SHEET (RULE 26)

202

<220>

<221> SITE

<222> (5)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 422

Arg	Xaa	Asp	Arg	Xaa	Pro	Val	Pro	Glu	Leu	Pro	Gly	Tyr	Glu	Pro	Thr
1				5					10					15	

Arg	Thr	Asp	Ile	Ser	Ser	Phe	Lys	Asn	Ile	Tyr	Arg	Tyr	Ala	Phe	Asp
		20						25					30		

Phe	Ala	Arg	Asp	Lys	Asp	Gln	Arg	Ser	Leu	Asp	Ile	Asp	Thr	Ala	Lys
		35					40					45			

Ser	Met	Leu	Ala	Leu	Leu	Leu	Gly	Arg	Thr	Trp	Pro	Leu	Phe	Ser	Val
	50					55					60				

Phe	Tyr	Gln	Tyr	Leu	Glu	Gln	Ser	Lys	Tyr	Arg	Val	Met	Asn	Lys	Asp
65					70					75					80

Gln	Trp	Tyr	Asn	Val	Leu	Glu	Phe	Ser	Arg	Thr	Val	His	Ala	Asp	Leu
			85						90					95	

Ser	Asn	Tyr	Asp	Glu	Asp	Gly	Ala	Trp	Pro	Val	Leu	Leu	Asp	Glu	Phe
			100					105					110		

Val	Glu	Trp	Gln	Lys	Val	Arg	Gln	Thr	Ser
	115						120		

<210> 423

<211> 28

<212> PRT

<213> Homo sapiens

<400> 423

Pro	Thr	Arg	Thr	Asp	Ile	Ser	Ser	Phe	Lys	Asn	Ile	Tyr	Arg	Tyr	Ala
1				5					10					15	

Phe	Asp	Phe	Ala	Arg	Asp	Lys	Asp	Gln	Arg	Ser	Leu
		20						25			

<210> 424

<211> 29

<212> PRT

<213> Homo sapiens

<400> 424

Ser	Met	Leu	Ala	Leu	Leu	Leu	Gly	Arg	Thr	Trp	Pro	Leu	Phe	Ser	Val
1				5					10					15	

Phe	Tyr	Gln	Tyr	Leu	Glu	Gln	Ser	Lys	Tyr	Arg	Val	Met
		20						25				

SUBSTITUTE SHEET (RULE 26)

203

<210> 425
<211> 27
<212> PRT
<213> Homo sapiens

<400> 425
Phe Ser Arg Thr Val His Ala Asp Leu Ser Asn Tyr Asp Glu Asp Gly
1 5 10 15
Ala Trp Pro Val Leu Leu Asp Glu Phe Val Glu
20 25

<210> 426
<211> 10
<212> PRT
<213> Homo sapiens

<400> 426
Ile Tyr Arg Tyr Ala Phe Asp Phe Ala Arg
1 5 10

<210> 427
<211> 8
<212> PRT
<213> Homo sapiens

<400> 427
Lys Asp Gln Arg Ser Leu Asp Ile
1 5

<210> 428
<211> 8
<212> PRT
<213> Homo sapiens

<400> 428
Asn Val Leu Glu Phe Ser Arg Thr
1 5

<210> 429
<211> 21
<212> PRT
<213> Homo sapiens

<400> 429
Asp Leu Ser Asn Tyr Asp Glu Asp Gly Ala Trp Pro Val Leu Leu Asp
1 5 10 15

Glu Phe Val Glu Trp
20

<210> 430

SUBSTITUTE SHEET (RULE 26)

<211> 37

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (15)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 430

Leu	Phe	Arg	Cys	Pro	Ile	Gly	Lys	Ala	Gly	Thr	Pro	Ala	Gly	Xaa	Gly
1				5					10					15	

Pro	Glu	Phe	Pro	Gly	Arg	Pro	Thr	Arg	Pro	Val	Arg	Glu	Lys	Glu	Leu
			20				25						30		

Thr	Glu	Thr	Phe	Glu
			35	

<210> 431

<211> 21

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (9)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 431

Gly	Lys	Ala	Gly	Thr	Pro	Ala	Gly	Xaa	Gly	Pro	Glu	Phe	Pro	Gly	Arg
1				5					10					15	

Pro	Thr	Arg	Pro	Val
			20	

<210> 432

<211> 45

<212> PRT

<213> Homo sapiens

<400> 432

Phe	Phe	Val	Phe	Pro	Tyr	Pro	Tyr	Pro	Phe	Arg	Pro	Leu	Pro	Pro	Ile
1				5					10					15	

Pro	Phe	Pro	Arg	Phe	Pro	Trp	Phe	Arg	Arg	Asn	Phe	Pro	Ile	Pro	Ile
			20					25					30		

Pro	Glu	Ser	Ala	Pro	Thr	Thr	Pro	Leu	Pro	Ser	Glu	Lys
		35					40					45

<210> 433

<211> 21

<212> PRT

SUBSTITUTE SHEET (RULE 26)

<213> Homo sapiens

<400> 433

Pro Trp Phe Arg Arg Asn Phe Pro Ile Pro Ile Pro Glu Ser Ala Pro
 1 5 10 15

Thr Thr Pro Leu Pro
 20

<210> 434

<211> 61

<212> PRT

<213> Homo sapiens

<400> 434

Phe Tyr Pro Pro Met Thr Gln Gly Lys Glu Ser Leu Pro Leu Leu Ala
 1 5 10 15

Leu Gln Ile Phe Asn Thr Thr Phe Arg Pro Ser Phe Ala Phe Phe Ser
 20 25 30

Gly His Arg Thr Leu Phe Phe Gly Val Arg Ser Pro Asn Pro Pro Lys
 35 40 45

Pro Arg Ile Phe Leu Ile Trp Leu Ile Ala Val Ala Leu
 50 55 60

<210> 435

<211> 31

<212> PRT

<213> Homo sapiens

<400> 435

Leu Leu Ala Leu Gln Ile Phe Asn Thr Thr Phe Arg Pro Ser Phe Ala
 1 5 10 15

Phe Phe Ser Gly His Arg Thr Leu Phe Phe Gly Val Arg Ser Pro
 20 25 30

<210> 436

<211> 52

<212> PRT

<213> Homo sapiens

<400> 436

His Leu Ala Gln Thr Val Met Met His Pro Gln Lys Ser Phe Tyr Gln
 1 5 10 15

Val Lys Asn Thr Asn His Ser Asp Arg Gly Ala Ile Glu Glu Thr Gln
 20 25 30

Ile Leu Glu Asp Arg Leu Gly Gln Ile Pro Leu Cys Leu Glu Ser Gln
 35 40 45

206

Ile Trp Glu Ala
50

<210> 437
<211> 28
<212> PRT
<213> Homo sapiens

<400> 437
Lys Asn Thr Asn His Ser Asp Arg Gly Ala Ile Glu Glu Thr Gln Ile
1 5 10 15

Leu Glu Asp Arg Leu Gly Gln Ile Pro Leu Cys Leu
20 25

<210> 438
<211> 73
<212> PRT
<213> Homo sapiens

<400> 438
Gln Gly Cys Tyr Arg Arg Asp Ser Asn Ile Gly Arg Gln Val Arg Pro
1 5 10 15

Asp Ser Ile Met Leu Arg Lys Pro Asp Leu Gly Ser Ile Thr His Tyr
20 25 30

Gly Ser Val Leu Gly Asn Leu Asn Tyr Cys Asp Leu Pro Gln Leu Tyr
35 40 45

Arg Asn Pro Ser Leu Gly Asn Ser Gly Met Arg Glu Met Phe Ser Pro
50 55 60

Phe Tyr Asn Pro Val Glu Cys His Pro
65 70

<210> 439
<211> 23
<212> PRT
<213> Homo sapiens

<400> 439
Pro Asp Ser Ile Met Leu Arg Lys Pro Asp Leu Gly Ser Ile Thr His
1 5 10 15

Tyr Gly Ser Val Leu Gly Asn
20

<210> 440
<211> 22
<212> PRT
<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

207

<400> 440

Tyr Arg Asn Pro Ser Leu Gly Asn Ser Gly Met Arg Glu Met Phe Ser
 1 5 10 15

Pro Phe Tyr Asn Pro Val
 20

<210> 441

<211> 21

<212> PRT

<213> Homo sapiens

<400> 441

Asn Ser Ala Arg Gly Leu Ser Gly Gly His Pro Phe Pro Trp Leu Ser
 1 5 10 15

Glu Gly His Pro Phe
 20

<210> 442

<211> 107

<212> PRT

<213> Homo sapiens

<400> 442

Thr Asp Ser Asp Leu Thr Leu Gly Ile Leu Leu Leu Gly Ile Tyr Thr
 1 5 10 15

Asn His Ile Trp Glu Met Phe Leu Ala Ala Ser Arg Ile Asn Ser Pro
 20 25 30

Lys Leu Glu Pro Glu Lys Ser Val Lys Arg Gln Ile Asn Phe Pro Ser
 35 40 45

Ser Lys Asp Val Gly Cys Ser Leu Glu Val Pro Lys Asp Gly Pro Pro
 50 55 60

Leu Ser His Gly Lys Glu Trp Ile Pro Leu Ser His Arg Lys Gly Trp
 65 70 75 80

Ile Pro Leu Ser His Met Lys Gly Trp Pro Ser Leu Ser His Gly Lys
 85 90 95

Gly Trp Pro Pro Leu Ser Pro Arg Ala Glu Phe
 100 105

<210> 443

<211> 20

<212> PRT

<213> Homo sapiens

<400> 443

Leu Gly Ile Leu Leu Leu Gly Ile Tyr Thr Asn His Ile Trp Glu Met
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

Phe Leu Ala Ala
20

<210> 444
<211> 27
<212> PRT
<213> Homo sapiens

<400> 444
Lys Ser Val Lys Arg Gln Ile Asn Phe Pro Ser Ser Lys Asp Val Gly
1 5 10 15

Cys Ser Leu Glu Val Pro Lys Asp Gly Pro Pro
20 25

<210> 445
<211> 27
<212> PRT
<213> Homo sapiens

<400> 445
Gly Lys Glu Trp Ile Pro Leu Ser His Arg Lys Gly Trp Ile Pro Leu
1 5 10 15

Ser His Met Lys Gly Trp Pro Ser Leu Ser His
20 25

<210> 446
<211> 47
<212> PRT
<213> Homo sapiens

<400> 446
Gly Trp Ala Ser Thr Gln Pro Arg Glu Arg Met Asp Pro Ala Gln Pro
1 5 10 15

Gln Glu Arg Met Asp Pro Ser Gln Pro His Glu Arg Met Ala Leu Thr
20 25 30

Gln Pro Trp Lys Arg Met Ala Pro Thr Gln Pro Ser Cys Arg Ile
35 40 45

<210> 447
<211> 24
<212> PRT
<213> Homo sapiens

<400> 447
Pro Ala Gln Pro Gln Glu Arg Met Asp Pro Ser Gln Pro His Glu Arg
1 5 10 15

Met Ala Leu Thr Gln Pro Trp Lys

SUBSTITUTE SHEET (RULE 26)

20

<210> 448

<211> 30

<212> PRT

<213> Homo sapiens

<400> 448

Ile Ala Asn Gly Gly Gly Arg Pro Ile Lys Leu Asn Ala Leu Tyr Lys
 1 5 10 15

Ile Gln Asn Glu Cys Lys Ile Val Phe Thr Cys Ile Asp Phe
 20 25 30

<210> 449

<211> 33

<212> PRT

<213> Homo sapiens

<400> 449

Met Pro Cys Ile Lys Ser Lys Met Asn Ala Lys Leu Phe Ser Leu Val
 1 5 10 15

Leu Thr Leu Cys Cys Met Ile Pro Ile Ser Val Leu Phe Gly Thr Cys
 20 25 30

Ile

<210> 450

<211> 101

<212> PRT

<213> Homo sapiens

<400> 450

Gln Val Ala Met Gly Ser Leu Ser Gly Leu Arg Leu Ala Ala Gly Ser
 1 5 10 15

Cys Phe Arg Leu Cys Glu Arg Asp Val Ser Ser Ser Leu Arg Leu Thr
 20 25 30

Arg Ser Ser Asp Leu Lys Arg Ile Asn Gly Phe Cys Thr Lys Pro Gln
 35 40 45

Glu Ser Pro Gly Ala Pro Ser Arg Thr Tyr Asn Arg Val Pro Leu His
 50 55 60

Lys Pro Thr Asp Trp Gln Lys Lys Ile Leu Ile Trp Ser Gly Arg Phe
 65 70 75 80

Lys Lys Glu Asp Glu Ile Pro Glu Thr Val Ser Leu Glu Met Leu Asp
 85 90 95

Ala Ala Lys Asn Lys

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210

100

<210> 451
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 451
 Gly Leu Arg Leu Ala Ala Gly Ser Cys Phe Arg Leu Cys Glu Arg Asp
 1 5 10 15

Val Ser Ser Ser Leu Arg Leu Thr Arg
 20 25

<210> 452
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 452
 Ala Pro Ser Arg Thr Tyr Asn Arg Val Pro Leu His Lys Pro Thr Asp
 1 5 10 15

Trp Gln Lys Lys
 20

<210> 453
 <211> 23
 <212> PRT
 <213> Homo sapiens

<400> 453
 Ile Trp Ser Gly Arg Phe Lys Lys Glu Asp Glu Ile Pro Glu Thr Val
 1 5 10 15

Ser Leu Glu Met Leu Asp Ala
 20

<210> 454
 <211> 63
 <212> PRT
 <213> Homo sapiens

<400> 454
 Met Asp Phe Ala Gln Asn His Arg Lys Val Pro Glu Leu His Pro Ala
 1 5 10 15

Leu Thr Thr Glu Cys Leu Tyr Thr Asn Leu Arg Ile Gly Arg Lys Arg
 20 25 30

Ser Ser Tyr Gly Gln Val Ala Ser Lys Arg Lys Met Lys Ser Gln Arg
 35 40 45

SUBSTITUTE SHEET (RULE 26)

211

Leu Ser Arg Trp Arg Cys Leu Met Leu Gln Arg Thr Arg Cys Glu
 50 55 60

<210> 455

<211> 19

<212> PRT

<213> Homo sapiens

<400> 455

Lys Val Pro Glu Leu His Pro Ala Leu Thr Thr Glu Cys Leu Tyr Thr
 1 5 10 15

Asn Leu Arg

<210> 456

<211> 26

<212> PRT

<213> Homo sapiens

<400> 456

Lys Arg Ser Ser Tyr Gly Gln Val Ala Ser Lys Arg Lys Met Lys Ser
 1 5 10 15

Gln Arg Leu Ser Arg Trp Arg Cys Leu Met
 20 25

<210> 457

<211> 12

<212> PRT

<213> Homo sapiens

<400> 457

Ile Asn Gly Phe Cys Thr Lys Pro Gln Glu Ser Pro
 1 5 10

<210> 458

<211> 9

<212> PRT

<213> Homo sapiens

<400> 458

Arg Val Pro Leu His Lys Pro Thr Asp
 1 5

<210> 459

<211> 8

<212> PRT

<213> Homo sapiens

<400> 459

Trp Ser Gly Arg Phe Lys Lys Glu

SUBSTITUTE SHEET (RULE 26)

212

1

5

<210> 460

<211> 9

<212> PRT

<213> Homo sapiens

<400> 460

Glu Met Leu Asp Ala Ala Lys Asn Lys

1

5

<210> 461

<211> 9

<212> PRT

<213> Homo sapiens

<400> 461

Ser Tyr Leu Met Ile Ala Leu Thr Val

1

5

<210> 462

<211> 9

<212> PRT

<213> Homo sapiens

<400> 462

Met Val Ile Glu Gly Lys Lys Ala Ala

1

5

<210> 463

<211> 68

<212> PRT

<213> Homo sapiens

<400> 463

Arg Pro Gly Met Arg Ala Leu Gly Ser Cys Leu Ser Leu Leu Ala Leu

1

5

10

15

Cys Ser Pro Gln Ala Arg Pro Gly Pro Arg Thr Leu Asp Ala Ser Thr

20

25

30

Ala Thr Leu Thr Pro His Phe Ser Pro Cys Ala Arg Phe Ser Pro Val

35

40

45

Gly Pro Ser Ala Val Pro Phe Ala Ala Thr Pro Leu Pro Leu Ala Gly

50

55

60

Pro His Gln Pro

65

<210> 464

<211> 20

SUBSTITUTE SHEET (RULE 26)

213

<212> PRT

<213> Homo sapiens

<400> 464

Gly Ser Cys Leu Ser Leu Leu Ala Leu Cys Ser Pro Gln Ala Arg Pro
 1 5 10 15

Gly Pro Arg Thr
 20

<210> 465

<211> 23

<212> PRT

<213> Homo sapiens

<400> 465

His Phe Ser Pro Cys Ala Arg Phe Ser Pro Val Gly Pro Ser Ala Val
 1 5 10 15

Pro Phe Ala Ala Thr Pro Leu
 20

<210> 466

<211> 92

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (43)

<223> Xaa equals any of the naturally occurring L-amino acids

<220>

<221> SITE

<222> (80)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 466

Ala Ile Glu Glu Arg Asn Lys Ser Arg Leu Thr Gln Gln Ala Ser Glu
 1 5 10 15

Pro Thr Gly Ser Pro Arg Tyr Leu His Glu Gln His Pro Gly Ser Arg
 20 25 30

Ser Gln Met Asp Cys Gly Ser Leu Thr Met Xaa Cys Pro Pro Pro Arg
 35 40 45

Val Arg Asp Asp Arg Thr Ser Ala Arg Gly Val Pro Arg Gln Ala Ala
 50 55 60

Pro Asp Ile Val Gly Gly Arg Pro Ser Ser Arg Ala Cys Val Ser Xaa
 65 70 75 80

Pro Ala Cys Ala Pro Ser Ala Ala Val Phe Pro Tyr
 85 90

SUBSTITUTE SHEET (RULE 26)

<210> 467

<211> 24

<212> PRT

<213> Homo sapiens

<400> 467

Leu Thr Gln Gln Ala Ser Glu Pro Thr Gly Ser Pro Arg Tyr Leu His
 1 5 10 15

Glu Gln His Pro Gly Ser Arg Ser
 20

<210> 468

<211> 25

<212> PRT

<213> Homo sapiens

<400> 468

Ser Ala Arg Gly Val Pro Arg Gln Ala Ala Pro Asp Ile Val Gly Gly
 1 5 10 15

Arg Pro Ser Ser Arg Ala Cys Val Ser
 20 25

<210> 469

<211> 14

<212> PRT

<213> Homo sapiens

<400> 469

Pro Arg Val Arg Lys Thr Pro His Leu Ser Ala Ser Gly Lys
 1 5 10

<210> 470

<211> 59

<212> PRT

<213> Homo sapiens

<400> 470

Tyr Tyr Tyr Ser Met Leu Lys Ile Cys His Ile Thr Ile Leu Glu Thr
 1 5 10 15

Leu Ser Asp Arg Thr Pro Arg Lys Phe Ala Lys Lys Cys Tyr Ile Leu
 20 25 30

Tyr Ile Lys Leu Ser Asp Ser Ser Val Glu Lys Val Ala Tyr Thr Leu
 35 40 45

Leu Leu Leu Ile Pro Ala Ala Ile Glu Lys Lys
 50 55

SUBSTITUTE SHEET (RULE 26)

215

<210> 471

<211> 32

<212> PRT

<213> Homo sapiens

<400> 471

Thr Ile Leu Glu Thr Leu Ser Asp Arg Thr Pro Arg Lys Phe Ala Lys
 1 5 10 15

Lys Cys Tyr Ile Leu Tyr Ile Lys Leu Ser Asp Ser Ser Val Glu Lys
 20 25 30

<210> 472

<211> 17

<212> PRT

<213> Homo sapiens

<400> 472

Val His Thr Lys Glu Ile Phe Arg Glu Arg Ser Ala Gly Phe Pro Val
 1 5 10 15

Lys

<210> 473

<211> 97

<212> PRT

<213> Homo sapiens

<400> 473

Leu Glu Met Gly Phe Gln Pro Thr Lys Glu Ile Asn Ala Arg Gly Ser
 1 5 10 15

Glu Pro Cys Gln Ala Gln Ser Thr Ser Leu Pro Lys Leu Pro Arg Trp
 20 25 30

Gly Ser Arg Pro Glu Ala Pro Gln Thr Pro Gln Gly Gly Leu Glu Ser
 35 40 45

Arg Cys Cys Thr Pro Val Ser Lys Gln Ser Leu Asn Leu Lys Ala Asp
 50 55 60

Arg Phe Lys Ala Leu Thr Leu Gly Arg Ala Gln Trp Leu Thr Pro Val
 65 70 75 80

Ile Gln Ala Leu Ser Glu Leu Arg Trp Val Asp His Leu Arg Ser Gly
 85 90 95

Val

SUBSTITUTE SHEET (RULE 26)

216

<210> 474
 <211> 24
 <212> PRT
 <213> Homo sapiens

<400> 474
 Phe Gln Pro Thr Lys Glu Ile Asn Ala Arg Gly Ser Glu Pro Cys Gln
 1 5 10 15

Ala Gln Ser Thr Ser Leu Pro Lys
 20

<210> 475
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 475
 Pro Lys Leu Pro Arg Trp Gly Ser Arg Pro Glu Ala Pro Gln Thr Pro
 1 5 10 15

Gln Gly Gly Leu Glu Ser Arg Cys Cys Thr Pro
 20 25

<210> 476
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 476
 Arg Phe Lys Ala Leu Thr Leu Gly Arg Ala Gln Trp Leu Thr Pro Val
 1 5 10 15

Ile Gln Ala Leu Ser Glu Leu Arg Trp Val Asp
 20 25

<210> 477
 <211> 176
 <212> PRT
 <213> Homo sapiens

<400> 477
 Arg Ile Pro Leu Gln Ser Asp Gly Ser Phe Leu His Glu Lys Ser Ser
 1 5 10 15

Gln Gln Arg Ser Asn Arg Asn Phe Pro Cys Pro Thr Leu Gln Cys Asn
 20 25 30

Pro Glu Val Ser Phe Trp Phe Val Val Thr Asp Pro Ser Lys Asn His
 35 40 45

Thr Leu Pro Ala Val Glu Val Gln Ser Ala Ile Arg Met Asn Lys Asn
 50 55 60

SUBSTITUTE SHEET (RULE 26)

217

Arg Ile Asn Asn Ala Phe Phe Leu Asn Asp Gln Thr Leu Glu Phe Leu
 65 70 75 80
 Lys Ile Pro Ser Thr Leu Ala Pro Pro Met Asp Pro Ser Val Pro Ile
 85 90 95
 Trp Ile Ile Ile Phe Gly Val Ile Phe Cys Ile Ile Ile Val Ala Ile
 100 105 110
 Ala Leu Leu Ile Leu Ser Gly Ile Trp Gln Arg Arg Arg Lys Asn Lys
 115 120 125
 Glu Pro Ser Glu Val Asp Asp Ala Glu Asp Lys Cys Glu Asn Met Ile
 130 135 140
 Thr Ile Glu Asn Gly Ile Pro Ser Asp Pro Leu Asp Met Lys Gly Gly
 145 150 155 160
 His Ile Asn Asp Ala Phe Met Thr Glu Asp Glu Arg Leu Thr Pro Leu
 165 170 175

<210> 478

<211> 25

<212> PRT

<213> Homo sapiens

<400> 478

Pro Cys Pro Thr Leu Gln Cys Asn Pro Glu Val Ser Phe Trp Phe Val
 1 5 10 15

Val Thr Asp Pro Ser Lys Asn His Thr
 20 25

<210> 479

<211> 23

<212> PRT

<213> Homo sapiens

<400> 479

Ala Ile Arg Met Asn Lys Asn Arg Ile Asn Asn Ala Phe Phe Leu Asn
 1 5 10 15

Asp Gln Thr Leu Glu Phe Leu
 20

<210> 480

<211> 24

<212> PRT

<213> Homo sapiens

<400> 480

SUBSTITUTE SHEET (RULE 26)

218

Ile Trp Gln Arg Arg Arg Lys Asn Lys Glu Pro Ser Glu Val Asp Asp
 1 5 10 15

Ala Glu Asp Lys Cys Glu Asn Met
 20

<210> 481

<211> 19

<212> PRT

<213> Homo sapiens

<400> 481

Pro Leu Asp Met Lys Gly Gly His Ile Asn Asp Ala Phe Met Thr Glu
 1 5 10 15

Asp Glu Arg

<210> 482

<211> 136

<212> PRT

<213> Homo sapiens

<400> 482

Gly Ser Arg Thr Thr Ala Leu Gln Arg Gly Val Ser Leu Ser Ser Ser
 1 5 10 15

Val Met Lys Ala Ser Leu Ile Cys Pro Pro Phe Met Ser Arg Gly Ser
 20 25 30

Glu Gly Met Pro Phe Ser Ile Val Ile Met Phe Ser His Leu Ser Ser
 35 40 45

Ala Ser Ser Thr Ser Asp Gly Ser Leu Phe Phe Leu Leu Arg Cys Gln
 50 55 60

Ile Pro Asp Lys Ile Ser Ser Ala Ile Ala Thr Met Met Met Gln Asn
 65 70 75 80

Ile Thr Pro Asn Ile Ile Ile Gln Met Gly Thr Asp Gly Ser Met Gly
 85 90 95

Gly Ala Ser Val Glu Gly Ile Phe Lys Asn Ser Arg Val Trp Ser Phe
 100 105 110

Arg Lys Lys Ala Leu Leu Ile Arg Phe Leu Phe Ile Leu Met Ala Asp
 115 120 125

Cys Thr Ser Thr Ala Gly Arg Val
 130 135

<210> 483

<211> 28

<212> PRT

SUBSTITUTE SHEET (RULE 26)

219

<213> Homo sapiens

<400> 483

Val Ser Leu Ser Ser Ser Val Met Lys Ala Ser Leu Ile Cys Pro Pro
 1 5 10 15

Phe Met Ser Arg Gly Ser Glu Gly Met Pro Phe Ser
 20 25

<210> 484

<211> 24

<212> PRT

<213> Homo sapiens

<400> 484

Ser Met Gly Gly Ala Ser Val Glu Gly Ile Phe Lys Asn Ser Arg Val
 1 5 10 15

Trp Ser Phe Arg Lys Lys Ala Leu
 20

<210> 485

<211> 29

<212> PRT

<213> Homo sapiens

<400> 485

Gly Ala Arg Gly Ser Gln Gln Asp Ala Pro Ala Leu Gln Glu Ala Glu
 1 5 10 15

Val Arg Gly Pro Glu Arg Ala Gln Pro Ala Arg Gly Arg
 20 25

<210> 486

<211> 439

<212> PRT

<213> Homo sapiens

<400> 486

Ser Glu Arg Pro Gly Glu Gly Pro Ala Arg Pro Gly Gln Asp Asp Gln
 1 5 10 15

Gly Pro Ala Val Pro Ala Val Ala Gly Ala Gly Val Gly Val His Asp
 20 25 30

Pro Ala Asp His Arg Val Leu Gly Gln Arg Ser Ala Ala His Phe Tyr
 35 40 45

Leu His Thr Ser Phe Ser Arg Pro His Thr Gly Pro Pro Leu Pro Thr
 50 55 60

Pro Gly Pro Asp Arg Thr Gly Ser Ser Arg Pro Thr Pro Met Ser Thr
 65 70 75 80

SUBSTITUTE SHEET (RULE 26)

SUBSTITUTE SHEET (RULE 26)

221

Pro Ala Ala Gly Arg Arg Thr Gly Ser Pro Arg Ser Pro Trp Pro Gly
 385 390 395 400

Gly Ser Ser Cys Ile Asn Ser Thr Arg Pro Thr Leu Phe Ser Ser Ala
 405 410 415

Thr Pro Ser Pro Lys Thr Ser Ser Glu Thr Glu Ser Phe Arg Val Ala
 420 425 430

Phe Ser Arg Val Pro Gly Thr
 435

<210> 487

<211> 25

<212> PRT

<213> Homo sapiens

<400> 487

Arg Pro Gly Gln Asp Asp Gln Gly Pro Ala Val Pro Ala Val Ala Gly
 1 5 10 15

Ala Gly Val Gly Val His Asp Pro Ala
 20 25

<210> 488

<211> 21

<212> PRT

<213> Homo sapiens

<400> 488

Ser Arg Pro His Thr Gly Pro Pro Leu Pro Thr Pro Gly Pro Asp Arg
 1 5 10 15

Thr Gly Ser Ser Arg
 20

<210> 489

<211> 23

<212> PRT

<213> Homo sapiens

<400> 489

Ser His Ala Gly Val Lys Gln Ser Asp Leu Pro Arg Lys Glu Thr Glu
 1 5 10 15

Gln Pro Pro Ala Pro Gly Glu
 20

<210> 490

<211> 23

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

222

<400> 490

Arg Arg Pro Ala Gln Pro Arg Pro Gly Pro Ala Ala Gly Gly Ala Glu
1 5 10 15

Glu Arg Ala Ala Gly Leu Leu
20

<210> 491

<211> 23

<212> PRT

<213> Homo sapiens

<400> 491

Arg Arg His Pro Gln Leu Gly Ala Glu Pro Pro Asp Arg Gly Arg Pro
1 5 10 15

Ala Arg Gly His Leu Leu Leu
20

<210> 492

<211> 25

<212> PRT

<213> Homo sapiens

<400> 492

Arg Asp Asp Arg Ala Glu Arg Lys Pro Ala Ala Pro Arg Cys Ala Leu
1 5 10 15

Pro Arg Pro Ala Ala His Pro Ala Arg
20 25

<210> 493

<211> 27

<212> PRT

<213> Homo sapiens

<400> 493

Arg Ala Pro Asp Leu Gln Gln Val Leu Ala Pro Leu Arg Glu Ala Leu
1 5 10 15

Pro Pro Pro His Glu Gly Gln Ala Gln Glu Val
20 25

<210> 494

<211> 26

<212> PRT

<213> Homo sapiens

<400> 494

Asp Leu Arg Leu Pro Gln Gln Val Arg Ala Gly Glu Arg Gly Val Leu
1 5 10 15

Pro Gln Val Arg Arg Ala His Ala Ala Gly

SUBSTITUTE SHEET (RULE 26)

<210> 495
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 495
 Gln Pro Ala Arg Leu Gly Ala Arg Gly Leu Pro Arg Trp Pro Gln Gly
 1 5 10 15

Val Leu Arg Gln Leu His Pro Val Pro Ala Gly
 20 25

<210> 496
 <211> 24
 <212> PRT
 <213> Homo sapiens

<400> 496
 Ala Gly Val Pro Pro Leu Pro Pro Val Pro Asp Arg Leu Arg Phe Leu
 1 5 10 15

Gly Lys Leu Glu Thr Leu Asp Glu
 20

<210> 497
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 497
 Gln Leu Leu Gln Leu Leu Gln Val Asp Arg Gln Ser Ala Ser Pro Arg
 1 5 10 15

Ala Thr Gly Thr Gly Pro Pro Ala Ala
 20 25

<210> 498
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 498
 Asn Ser Thr Arg Pro Thr Leu Phe Ser Ser Ala Thr Pro Ser Pro Lys
 1 5 10 15

Thr Ser Ser Glu Thr Glu Ser Phe Arg
 20 25

<210> 499
 <211> 324

SUBSTITUTE SHEET (RULE 26)

225

Ser Arg Gln His Glu Lys Leu Ser Arg Asn Ser Ser Thr Ser Glu Ser
 290 295 300

Ala Val Ser Ser Leu Ser Cys Pro Ala Arg Ala Trp Ala Ala Ala Ala
 305 310 315 320

Pro Cys Ala Ala

<210> 500

<211> 23

<212> PRT

<213> Homo sapiens

<400> 500

Glu Ala Val His Leu Pro Pro Val Leu Val Glu Gly Arg Gln Leu Leu
 1 5 10 15

Arg Val Arg Val Gln Gln Val
 20

<210> 501

<211> 24

<212> PRT

<213> Homo sapiens

<400> 501

Gly His Leu Glu Ala Ser Ala Glu Gly Leu Ala Arg Arg Gly Gly Gln
 1 5 10 15

Ala Gly Val Val Gly Val His Pro
 20

<210> 502

<211> 28

<212> PRT

<213> Homo sapiens

<400> 502

Gln Leu Glu Leu Ala Ala Glu Gly Gly Asp Gln Ala His Glu Gly Val
 1 5 10 15

Ala His Glu Glu Glu Leu Gly Val Leu Leu Glu Leu
 20 25

<210> 503

<211> 27

<212> PRT

<213> Homo sapiens

<400> 503

Gly Glu Leu Pro Val Ala Ala Pro Glu Leu Val Glu Gly Gln Val Arg

226

5

10

15

Val Val His Val Leu Ala Arg Asp Ala

20

25

> 504

<211> 25

<212> PRT

<213> Homo sapiens

<400> 504

Ala Val Gln Gln Ala Ser Ala Gln His Asp His His Ala Leu Pro Val

1

5

10

15

Gly Ala Gly His Leu Gly His Val Ala

20

25

<210> 505

<211> 25

<212> PRT

<213> Homo sapiens

<400> 505

His Asp Gln Val Ala Gln Leu Arg Val Gly Asp Val Val Glu Cys Ala

1

5

10

15

Leu Leu Gly Gly Glu Gly Gln Ala Gly

20

25

<210> 506

<211> 23

<212> PRT

<213> Homo sapiens

<400> 506

Ala Leu Val Trp Ala Ala Pro Gly Val Ala Arg Gly Pro Val Val Ala

1

5

10

15

Ser His Ala Leu Leu His Ala

20

<210> 507

<211> 28

<212> PRT

<213> Homo sapiens

<400> 507

Pro Pro Ala Gln Ala Ala Ala Pro Ser Pro Phe Trp Glu Gly His Ser

1

5

10

15

Ala Ser Arg Gln His Glu Lys Leu Ser Arg Asn Ser

20

25

<210> 508

<211> 314

<212> PRT

<213> Homo sapiens

<400> 508

Ser Arg Val Thr Phe Pro Glu Arg Arg Arg Ser Ser Arg Leu Arg Arg
 1 5 10 15

Gly Ser Met Glu Glu Ser Val Arg Gly Tyr Asp Trp Ser Pro Arg Asp
 20 25 30

Ala Arg Arg Ser Pro Asp Gln Gly Arg Gln Gln Ala Glu Arg Arg Asn
 35 40 45

Val Leu Arg Gly Phe Cys Ala Asn Ser Ser Leu Ala Phe Pro Thr Lys
 50 55 60

Glu Arg Ala Phe Asp Asp Ile Pro Asn Ser Glu Leu Ser His Leu Ile
 65 70 75 80

Val Asp Asp Arg His Gly Ala Ile Tyr Cys Tyr Val Pro Lys Val Ala
 85 90 95

Cys Thr Asn Trp Lys Arg Val Met Ile Val Leu Ser Gly Ser Leu Leu
 100 105 110

His Arg Gly Ala Pro Tyr Arg Asp Pro Leu Arg Ile Pro Arg Glu His
 115 120 125

Val His Asn Ala Ser Ala His Leu Thr Phe Asn Lys Phe Trp Arg Arg
 130 135 140

Tyr Gly Lys Leu Ser Arg His Leu Met Lys Val Lys Leu Lys Lys Tyr
 145 150 155 160

Thr Lys Phe Leu Phe Val Arg Asp Pro Phe Val Arg Leu Ile Ser Ala
 165 170 175

Phe Arg Ser Lys Phe Glu Leu Glu Asn Glu Glu Phe Tyr Arg Lys Phe
 180 185 190

Ala Val Pro Met Leu Arg Val Tyr Ala Asn His Thr Ser Leu Pro Ala
 195 200 205

Ser Ala Arg Glu Ala Phe Arg Ala Gly Leu Lys Val Ser Phe Ala Asn
 210 215 220

Phe Ile Gln Tyr Leu Leu Asp Pro His Thr Glu Lys Leu Ala Pro Phe
 225 230 235 240

Asn Glu His Trp Arg Gln Val Tyr Arg Leu Cys His Pro Cys Gln Ile
 245 250 255

Asp Tyr Asp Ser Trp Gly Ser Trp Arg Leu Trp Thr Arg Thr Pro Arg
 260 265 270

SUBSTITUTE SHEET (RULE 26)

Ser Cys Cys Ser Tyr Ser Arg Trp Thr Gly Ser Pro Leu Pro Pro Glu
275 280 285

Leu Pro Glu Gln Asp Arg Gln Gln Leu Gly Gly Gly Leu Val Arg Gln
290 295 300

Asp Pro Pro Gly Leu Glu Ala Ala Ala Val
305 310

<210> 509
<211> 26
<212> PRT
<213> Homo sapiens

<400> 509
Arg Ser Pro Asp Gln Gly Arg Gln Gln Ala Glu Arg Arg Asn Val Leu
1 5 10 15

Arg Gly Phe Cys Ala Asn Ser Ser Leu Ala
20 25

<210> 510
<211> 28
<212> PRT
<213> Homo sapiens

<400> 510
Thr Lys Glu Arg Ala Phe Asp Asp Ile Pro Asn Ser Glu Leu Ser His
1 5 10 15

Leu Ile Val Asp Asp Arg His Gly Ala Ile Tyr Cys
20 25

<210> 511
<211> 23
<212> PRT
<213> Homo sapiens

<400> 511
Phe Asn Lys Phe Trp Arg Arg Tyr Gly Lys Leu Ser Arg His Leu Met
1 5 10 15

Lys Val Lys Leu Lys Lys Tyr
20

<210> 512
> 24
> PRT
> Homo sapiens

> 512
'al Arg Leu Ile Ser Ala Phe Arg Ser Lys Phe Glu Leu Glu Asn

SUBSTITUTE SHEET (RULE 26)

<213> Homo sapiens

<400> 522

Ala Lys Thr Trp Lys Leu Gly Ile Asp Lys Val Gln Arg Asp Val Gly
 1 5 10 15

Asn Ser Ala Cys Gly Pro Ala His Thr Glu
 20 25

<210> 523

<211> 42

<212> PRT

<213> Homo sapiens

<400> 523

Trp Ala Pro Gly Ser Pro Trp Ile Met Pro Gln Gly Arg Ser Ser Asn
 1 5 10 15

Thr Gly Leu Phe Arg Val Arg Lys Arg Arg Met Thr Gly Leu Pro Ser
 20 25 30

Cys Thr Leu Gly Phe Pro Phe Ile Ser Thr
 35 40

<210> 524

<211> 17

<212> PRT

<213> Homo sapiens

<400> 524

Ser Ser Tyr Gln Cys Pro Lys Val Thr Phe Phe Lys Ser Ser Val Asp
 1 5 10 15

Thr

<210> 525

<211> 14

<212> PRT

<213> Homo sapiens

<400> 525

Tyr Ile Tyr Ser Tyr Leu Gly Phe Phe Asn Gln Ile Asn Lys
 1 5 10

<210> 526

<211> 6

<212> PRT

<213> Homo sapiens

<400> 526

Ala Arg Asp Leu Ile Leu
 1 5

SUBSTITUTE SHEET (RULE 26)

231

Ala Asp Cys Cys Ser Leu
20

<210> 520
<211> 155
<212> PRT
<213> Homo sapiens

<400> 520
Asn Lys Arg Lys Thr Tyr Leu Phe Leu Glu Val Gly Met Trp Gly Val
1 5 10 15
Gly Gln Asn Arg Trp Trp Pro Trp Glu Arg Val Pro Arg Gly Arg Gly
20 25 30
Trp Gly Cys Leu Ser Lys Glu Gly Gln Val Met Asn Arg Ala Ser Thr
35 40 45
Pro Ser Arg Gly Phe Leu Gly Pro Pro Lys His Trp Ala Lys Thr Trp
50 55 60
Lys Leu Gly Ile Asp Lys Val Gln Arg Asp Val Gly Asn Ser Ala Cys
65 70 75 80
Gly Pro Ala His Thr Glu Gln Gly Pro Phe Val Glu Gly Arg Trp Lys
85 90 95
Val Met Ser Trp Gly Trp Ala Pro Gly Ser Pro Trp Ile Met Pro Gln
100 105 110
Gly Arg Ser Ser Asn Thr Gly Leu Phe Arg Val Arg Lys Arg Arg Met
115 120 125
Thr Gly Leu Pro Ser Cys Thr Leu Gly Phe Pro Phe Ile Ser Thr Ala
130 135 140
Arg Arg Ser Pro Leu Gly Ser Gln Thr Met Glu
145 150 155

<210> 521
<211> 26
<212> PRT
<213> Homo sapiens

<400> 521
Gly Val Gly Gln Asn Arg Trp Trp Pro Trp Glu Arg Val Pro Arg Gly
1 5 10 15
Arg Gly Trp Gly Cys Leu Ser Lys Glu Gly
20 25

<210> 522
<211> 26
<212> PRT

SUBSTITUTE SHEET (RULE 26)

229

1 5 10 15

Glu Glu Phe Tyr Arg Lys Phe Ala
20

<210> 513
<211> 26
<212> PRT
<213> Homo sapiens

<400> 513
Thr Ser Leu Pro Ala Ser Ala Arg Glu Ala Phe Arg Ala Gly Leu Lys
1 5 10 15
Val Ser Phe Ala Asn Phe Ile Gln Tyr Leu
20 25

<210> 514
<211> 25
<212> PRT
<213> Homo sapiens

<400> 514
Ser Tyr Ser Arg Trp Thr Gly Ser Pro Leu Pro Pro Glu Leu Pro Glu
1 5 10 15
Gln Asp Arg Gln Gln Leu Gly Gly Gly
20 25

<210> 515
<211> 6
<212> PRT
<213> Homo sapiens

<400> 515
Ser Thr Gly Cys Ser Glu
1 5

<210> 516
<211> 146
<212> PRT
<213> Homo sapiens

<400> 516
Cys Leu Cys Leu Gly Cys Gly Leu Pro Glu Leu His Ser Tyr Leu Asp
1 5 10 15
Pro Gly Pro Tyr Leu Leu Val Tyr Pro Thr Leu Phe Trp Leu Cys Pro
20 25 30
Ser Ala Val Ser Pro Trp Ala Tyr Thr Cys Tyr Gln Leu Gly Leu Gly
35 40 45

SUBSTITUTE SHEET (RULE 26)

230

Pro Gln Trp Gly Ala Ala Ala Leu Ser Phe Thr Val Asp Ala Ala Ile
50 55 60

Arg Val Trp Asp Val Ser Thr Glu Thr Cys Val Pro Leu Pro Trp Phe
65 70 75 80

Arg Gly Gly Gly Val Thr Asn Cys Ser Gly Pro Gln Thr Ala Ala Lys
85 90 95

Ser Trp Leu Pro Leu Leu Gln Leu Ser Phe Glu Ser Gly Arg Pro Arg
100 105 110

Cys Gly Leu Val Arg Gly Gly Leu Leu Tyr Gln Gly Ala Val Arg Leu
115 120 125

Ala Ala Gly Ala Gln Met Ala Ala Asp Cys Cys Ser Leu Tyr Trp Glu
130 135 140

Ser His
145

<210> 517
<211> 26
<212> PRT
<213> Homo sapiens

<400> 517
Tyr Pro Thr Leu Phe Trp Leu Cys Pro Ser Ala Val Ser Pro Trp Ala
1 5 10 15

Tyr Thr Cys Tyr Gln Leu Gly Leu Gly Pro
20 25

<210> 518
<211> 25
<212> PRT
<213> Homo sapiens

<400> 518
Asp Val Ser Thr Glu Thr Cys Val Pro Leu Pro Trp Phe Arg Gly Gly
1 5 10 15

Gly Val Thr Asn Cys Ser Gly Pro Gln
20 25

<210> 519
<211> 22
<212> PRT
<213> Homo sapiens

<400> 519
Leu Leu Tyr Gln Gly Ala Val Arg Leu Ala Ala Gly Ala Gln Met Ala
1 5 10 15

SUBSTITUTE SHEET (RULE 26)

<210> 527

<211> 43

<212> PRT

<213> Homo sapiens

<400> 527

Leu Thr Phe Tyr Leu Gln Phe Leu Ala Pro Lys Asp Lys Pro Ser Gly
 1 5 10 15

Asp Thr Ala Ala Val Phe Glu Glu Gly Gly Asp Val Asp Asp Leu Val
 20 25 30

Ser Thr Phe Asn Met His Leu Val Phe Cys Asp
 35 40

<210> 528

<211> 25

<212> PRT

<213> Homo sapiens

<400> 528

Phe Leu Ala Pro Lys Asp Lys Pro Ser Gly Asp Thr Ala Ala Val Phe
 1 5 10 15

Glu Glu Gly Gly Asp Val Asp Asp Leu
 20 25

<210> 529

<211> 13

<212> PRT

<213> Homo sapiens

<400> 529

Ala Arg Ala Gly Ala Lys Ile Leu Phe Glu Gly Glu Phe
 1 5 10

<210> 530

<211> 92

<212> PRT

<213> Homo sapiens

<400> 530

Asn Phe Glu Ile His Ser Ala Phe Pro Phe Met Leu Phe Val Ala Cys
 1 5 10 15

Leu Leu His Ser Ser Cys Pro Arg Thr Ala Arg Phe Leu Ala Ser Pro
 20 25 30

Leu Ser Glu Ser Asn Val Ile Phe Tyr Gln Asn Gln Tyr Gln Phe Pro
 35 40 45

Cys Ile Leu Cys Phe Ile Glu Phe Ala Arg Leu Thr Ser Phe Lys His

234

50

55

60

Leu Ile His Ser Gln Ser His Leu Val Arg Leu Gln Tyr Glu Asp Phe
 65 70 75 80

Ser Val Ser Ser Glu Ala Trp Asp Thr Glu Leu Thr
 85 90

<210> 531

<211> 26

<212> PRT

<213> Homo sapiens

<400> 531

Phe Pro Phe Met Leu Phe Val Ala Cys Leu Leu His Ser Ser Cys Pro
 1 5 10 15

Arg Thr Ala Arg Phe Leu Ala Ser Pro Leu
 20 25

<210> 532

<211> 26

<212> PRT

<213> Homo sapiens

<400> 532

Asn Val Ile Phe Tyr Gln Asn Gln Tyr Gln Phe Pro Cys Ile Leu Cys
 1 5 10 15

Phe Ile Glu Phe Ala Arg Leu Thr Ser Phe
 20 25

<210> 533

<211> 23

<212> PRT

<213> Homo sapiens

<400> 533

Ser Gln Ser His Leu Val Arg Leu Gln Tyr Glu Asp Phe Ser Val Ser
 1 5 10 15

Ser Glu Ala Trp Asp Thr Glu
 20

<210> 534

<211> 10

<212> PRT

<213> Homo sapiens

<400> 534

Gln Lys Phe Leu Cys Ala Ser Asp Gly Asp
 1 5 10

SUBSTITUTE SHEET (RULE 26)

<210> 535
 <211> 177
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (160)
 <223> Xaa equals any of the naturally occurring L-amino acids

<220>
 <221> SITE
 <222> (162)
 <223> Xaa equals any of the naturally occurring L-amino acids

<400> 535
 Ala Glu Val Pro Leu Arg Val Arg Arg Arg His Gly Arg Pro His Gly
 1 5 10 15
 Pro Gly Gly Arg Gln Leu Ala Leu Gly Ile Pro Ala Leu Arg Ser Leu
 20 25 30
 Pro Gly Cys Val Pro Arg His His Gly Cys Ser Pro Gly Tyr Gly Cys
 35 40 45
 Leu His Arg Arg Ile Leu Cys Leu Pro Leu Ile Leu Leu Leu Val Tyr
 50 55 60
 Lys Gln Arg Gln Ala Ala Ser Asn Arg Arg Ala Gln Glu Leu Val Arg
 65 70 75 80
 Met Asp Ser Asn Ile Gln Gly Ile Glu Asn Pro Gly Phe Glu Ala Ser
 85 90 95
 Pro Pro Ala Gln Gly Ile Pro Glu Ala Lys Val Arg His Pro Leu Ser
 100 105 110
 Tyr Val Ala Gln Arg Gln Pro Ser Glu Ser Gly Arg His Leu Leu Ser
 115 120 125
 Glu Pro Ser Thr Pro Leu Ser Pro Pro Gly Pro Gly Asp Val Phe Phe
 130 135 140
 Pro Ser Leu Asp Pro Val Pro Asp Ser Pro Asn Phe Glu Val Ile Xaa
 145 150 155 160
 Pro Xaa Trp Gly Thr Val Gly Cys Cys Gly Trp Val Trp Gly Arg Cys
 165 170 175

Ile

<210> 536
 <211> 27
 <212> PRT

236

<213> Homo sapiens

<400> 536

Gly Pro Gly Gly Arg Gln Leu Ala Leu Gly Ile Pro Ala Leu Arg Ser
 1 5 10 15

Leu Pro Gly Cys Val Pro Arg His His Gly Cys
 20 25

<210> 537

<211> 25

<212> PRT

<213> Homo sapiens

<400> 537

Phe Glu Ala Ser Pro Pro Ala Gln Gly Ile Pro Glu Ala Lys Val Arg
 1 5 10 15

His Pro Leu Ser Tyr Val Ala Gln Arg
 20 25

<210> 538

<211> 88

<212> PRT

<213> Homo sapiens

<400> 538

Asp Met Ser Leu Gly Met Trp Gln His Gln Trp Asp Lys Met Asp Thr
 1 5 10 15

Gly Pro Pro Ser Gln Ala Pro Asp Thr Gly His Gly Gly Glu Thr Ser
 20 25 30

Pro Pro Trp His Ala Leu Gly Ser Pro Val Leu Pro Glu Ala Ala Leu
 35 40 45

Leu Ser Asp Phe Leu Phe Val Pro Gln Trp Leu Trp Gly Gln Ala Cys
 50 55 60

Leu Pro Thr Gly His Arg His Leu Pro Gln Leu Pro Pro Thr Ser Ser
 65 70 75 80

Phe Ser Glu Asp Leu Ser Thr Gly
 85

<210> 539

<211> 78

<212> PRT

<213> Homo sapiens

<400> 539

Pro Val Asp Arg Ser Ser Glu Lys Leu Leu Val Gly Gly Ser Trp Gly
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

237

Arg Trp Arg Trp Pro Val Gly Arg Gln Ala Trp Pro Gln Ser His Cys
 20 25 30

Gly Thr Lys Arg Lys Ser Asp Arg Arg Ala Ala Ser Gly Lys Thr Gly
 35 40 45

Glu Pro Ser Ala Cys His Gly Gly Glu Val Ser Pro Pro Cys Pro Val
 50 55 60

Ser Gly Ala Trp Glu Gly Gly Pro Val Ser Ile Leu Ser His
 65 70 75

<210> 540
 <211> 22
 <212> PRT
 <213> Homo sapiens

<400> 540
 Pro Val Asp Arg Ser Ser Glu Lys Leu Leu Val Gly Gly Ser Trp Gly
 1 5 10 15

Arg Trp Arg Trp Pro Val
 20

<210> 541
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 541
 Thr Lys Arg Lys Ser Asp Arg Arg Ala Ala Ser Gly Lys Thr Gly Glu
 1 5 10 15

Pro Ser Ala Cys His Gly Gly Glu Val
 20 25

<210> 542
 <211> 46
 <212> PRT
 <213> Homo sapiens

<400> 542
 Met Thr Ser Lys Phe Gly Glu Ser Gly Thr Gly Ser Arg Asp Gly Lys
 1 5 10 15

Lys Thr Ser Pro Gly Pro Gly Gly Asp Arg Gly Val Leu Gly Ser Glu
 20 25 30

Ser Arg Cys Arg Pro Asp Ser Glu Gly Cys Arg Trp Ala Thr
 35 40 45

<210> 543
 <211> 20

SUBSTITUTE SHEET (RULE 26)

<212> PRT

<213> Homo sapiens

<400> 543

Ser Pro Gly Pro Gly Gly Asp Arg Gly Val Leu Gly Ser Glu Ser Arg
 1 5 10 15

Cys Arg Pro Asp
 20

<210> 544

<211> 23

<212> PRT

<213> Homo sapiens

<400> 544

Pro Pro Ser Gln Ala Pro Asp Thr Gly His Gly Gly Glu Thr Ser Pro
 1 5 10 15

Pro Trp His Ala Leu Gly Ser
 20

<210> 545

<211> 15

<212> PRT

<213> Homo sapiens

<400> 545

His Glu Val Gln Pro Ser Tyr Leu Pro Ser Asn Ser Gly Leu Ile
 1 5 10 15

<210> 546

<211> 22

<212> PRT

<213> Homo sapiens

<400> 546

Leu Arg Ile Ser Val Leu Cys Arg Glu Thr Ala Cys Asn Trp Ser His
 1 5 10 15

His Pro Leu Asp Ser Asn
 20

<210> 547

<211> 32

<212> PRT

<213> Homo sapiens

<400> 547

Leu Thr Val Thr Val Arg Asn Pro Gly Ser Thr His Ala Ser Gly Arg
 1 5 10 15

Pro Arg Arg Arg Ser Gly Val Trp Ala Arg Arg Gly Leu Val Trp Gln

SUBSTITUTE SHEET (RULE 26)

239

20

25

30

<210> 548
 <211> 38
 <212> PRT
 <213> Homo sapiens

<400> 548
 Thr Pro Cys Ser Ala Gln Phe Ser Val Leu Gly Pro Ser Gly Pro Ile
 1 5 10 15
 Leu Ala Met Val Gly Glu Asp Ala Asp Leu Pro Cys His Leu Phe Pro
 20 25 30
 Thr Met Ser Ala Glu Thr
 35

<210> 549
 <211> 60
 <212> PRT
 <213> Homo sapiens

<400> 549
 Met Glu Leu Lys Trp Val Ser Ser Ser Leu Arg Gln Val Val Asn Val
 1 5 10 15
 Tyr Ala Asp Gly Lys Glu Val Glu Asp Arg Gln Ser Ala Pro Tyr Arg
 20 25 30
 Gly Arg Thr Ser Ile Leu Arg Asp Gly Ile Thr Ala Gly Lys Ala Ala
 35 40 45
 Leu Arg Ile His Asn Val Thr Ala Ser Asp Ser Gly
 50 55 60

<210> 550
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 550
 Leu Glu Val Lys Gly Tyr Glu Asp Gly Gly Ile His Leu Glu Cys Arg
 1 5 10 15
 Ser Thr Gly Trp Tyr Pro Gln Pro Gln Ile
 20 25

<210> 551
 <211> 80
 <212> PRT

240

<213> Homo sapiens

<400> 551

Met Ala Ser Ser Leu Ala Phe Leu Leu Leu Asn Phe His Val Ser Leu
 1 5 10 15

Leu Leu Val Gln Leu Leu Thr Pro Cys Ser Ala Gln Phe Ser Val Leu
 20 25 30

Gly Pro Ser Gly Pro Ile Leu Ala Met Val Gly Glu Asp Ala Asp Leu
 35 40 45

Pro Cys His Leu Phe Pro Thr Met Ser Ala Glu Thr Met Glu Leu Lys
 50 55 60

Trp Val Ser Ser Ser Leu Arg Gln Val Val Asn Val Tyr Ala Asp Gly
 65 70 75 80

<210> 552

<211> 103

<212> PRT

<213> Homo sapiens

<400> 552

Arg His Glu Leu Ser His Asn Arg Lys Asn Gly Glu Leu Leu Ile Asp
 1 5 10 15

Arg Leu Tyr Ser Val Gly Ser Asp Ser Pro Met Gly Ile Pro Arg Asp
 20 25 30

Ile Ile Phe Thr Asp Gly Phe Pro Tyr Trp Asn Pro Lys Val Lys Thr
 35 40 45

Leu Lys Asp Arg His Phe Trp Gln Ser Ile Asp Glu Asn Gly Lys Phe
 50 55 60

Pro Gly Phe Pro Ser Ala Gln Leu Ser Cys Leu Pro Pro Leu Gly Pro
 65 70 75 80

Ala Ala His Ser Leu Leu Ser Ser Val Phe Cys Ala Trp Thr Leu Trp
 85 90 95

Ala His Pro Gly His Gly Gly
 100

<210> 553

<211> 24

<212> PRT

<213> Homo sapiens

<400> 553

Leu Leu Ile Asp Arg Leu Tyr Ser Val Gly Ser Asp Ser Pro Met Gly

SUBSTITUTE SHEET (RULE 26)

241

1

5

10

15

Ile Pro Arg Asp Ile Ile Phe Thr
20

<210> 554

<211> 25

<212> PRT

<213> Homo sapiens

<400> 554

Asn Pro Lys Val Lys Thr Leu Lys Asp Arg His Phe Trp Gln Ser Ile
1 5 10 15

Asp Glu Asn Gly Lys Phe Pro Gly Phe
20 25

<210> 555

<211> 24

<212> PRT

<213> Homo sapiens

<400> 555

Leu Gly Pro Ala Ala His Ser Leu Leu Ser Ser Val Phe Cys Ala Trp
1 5 10 15

Thr Leu Trp Ala His Pro Gly His
20

<210> 556

<211> 135

<212> PRT

<213> Homo sapiens

<400> 556

Arg Leu Gln His Trp Val Leu Ile Phe Thr Leu Glu Val Lys Gly Tyr
1 5 10 15

Glu Asp Gly Gly Ile His Leu Glu Cys Arg Ser Thr Gly Trp Tyr Pro
20 25 30

Gln Pro Gln Ile Gln Trp Ser Asn Ala Lys Gly Glu Asn Ile Pro Ala
35 40 45

Val Glu Ala Pro Val Val Ala Asp Gly Val Gly Leu Tyr Glu Val Ala
50 55 60

Ala Ser Val Ile Met Arg Gly Gly Ser Gly Glu Gly Val Ser Cys Ile
65 70 75 80

Ile Arg Asn Ser Leu Leu Gly Leu Glu Lys Thr Ala Ser Ile Ser Ile
85 90 95

Ala Asp Pro Ser Ser Gly Ala Pro Ser Pro Gly Ser Gln Pro Trp Gln

SUBSTITUTE SHEET (RULE 26)

242

100 105 110

Gly Pro Cys Leu Ser Cys Cys Cys Phe Ser Pro Glu Pro Val Thr Ser
 115 120 125

Cys Gly Asp Asn Arg Arg Lys
 130 135

<210> 557
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 557
 Gly Gly Ile His Leu Glu Cys Arg Ser Thr Gly Trp Tyr Pro Gln Pro
 1 5 10 15

Gln Ile Gln Trp Ser Asn Ala Lys Gly
 20 25

<210> 558
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 558
 Pro Gln Ile Gln Trp Ser Asn Ala Lys Gly Glu Asn Ile Pro Ala Val
 1 5 10 15

Glu Ala Pro Val Val Ala Asp Gly Val Gly Leu
 20 25

<210> 559
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 559
 Asn Ile Pro Ala Val Glu Ala Pro Val Val Ala Asp Gly Val Gly Leu
 1 5 10 15

Tyr Glu Val Ala Ala Ser Val Ile Met Arg Gly
 20 25

<210> 560
 <211> 27
 <212> PRT
 <213> Homo sapiens

<400> 560
 Ser Gly Ala Pro Ser Pro Gly Ser Gln Pro Trp Gln Gly Pro Cys Leu
 1 5 10 15

SUBSTITUTE SHEET (RULE 26)

243

Ser Cys Cys Cys Phe Ser Pro Glu Pro Val Thr
 20 25

<210> 561
 <211> 131
 <212> PRT
 <213> Homo sapiens

<400> 561
 Ser Ser Ser Ile Cys Asp His Glu Arg Arg Leu Arg Gly Gly Cys Ile
 1 5 10 15
 Leu His His Gln Lys Phe Pro Pro Arg Pro Gly Lys Asp Ser Gln His
 20 25 30
 Phe His Arg Arg Pro Phe Phe Arg Ser Ala Gln Pro Trp Ile Ala Ala
 35 40 45
 Leu Ala Gly Thr Leu Pro Ile Leu Leu Leu Leu Ala Gly Ala Ser
 50 55 60
 Tyr Phe Leu Trp Arg Gln Gln Lys Glu Ile Thr Ala Leu Ser Ser Glu
 65 70 75 80
 Ile Glu Ser Glu Gln Glu Met Lys Glu Met Gly Tyr Ala Ala Thr Glu
 85 90 95
 Arg Glu Ile Ser Leu Arg Glu Ser Leu Gln Glu Glu Leu Lys Arg Lys
 100 105 110
 Lys Ile Gln Tyr Leu Thr Arg Gly Glu Glu Ser Ser Ser Asp Thr Asn
 115 120 125
 Lys Ser Ala
 130

<210> 562
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 562
 Lys Asp Ser Gln His Phe His Arg Arg Pro Phe Phe Arg Ser Ala Gln
 1 5 10 15
 Pro Trp Ile Ala Ala Leu Ala Gly Thr Leu Pro Ile
 20 25

<210> 563
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 563

244

Glu Ile Glu Ser Glu Gln Glu Met Lys Glu Met Gly Tyr Ala Ala Thr
 1 5 10 15

Glu Arg Glu Ile Ser Leu Arg Glu Ser Leu Gln Glu
 20 25

<210> 564

<211> 33

<212> PRT

<213> Homo sapiens

<400> 564

Val Asn Asn Met Ile Ala Phe Tyr Ser Ala Arg Asp Ser Tyr Val Tyr
 1 5 10 15

Pro His Phe Ser Gly Glu Glu Met Leu Gln Met Arg Leu His Leu Val
 20 25 30

Lys

<210> 565

<211> 38

<212> PRT

<213> Homo sapiens

<400> 565

Thr Pro Cys Ser Ala Gln Phe Ser Val Leu Gly Pro Ser Gly Pro Ile
 1 5 10 15

Leu Ala Met Val Gly Glu Asp Ala Asp Leu Pro Cys His Leu Phe Pro
 20 25 30

Thr Met Ser Ala Glu Thr
 35

<210> 566

<211> 23

<212> PRT

<213> Homo sapiens

<400> 566

Lys Trp Val Ser Ser Ser Leu Arg Gln Val Val Asn Val Tyr Ala Asp
 1 5 10 15

Gly Lys Glu Val Glu Asp Arg
 20

<210> 567

<211> 25

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

245

<400> 567

Arg Thr Ser Ile Leu Arg Asp Gly Ile Thr Ala Gly Lys Ala Ala Leu
 1 5 10 15

Arg Ile His Asn Val Thr Ala Ser Asp
 20 25

<210> 568

<211> 23

<212> PRT

<213> Homo sapiens

<400> 568

Cys Tyr Phe Gln Asp Gly Asp Phe Tyr Glu Lys Ala Leu Val Glu Leu
 1 5 10 15

Lys Val Ala Ala Leu Gly Ser
 20

<210> 569

<211> 23

<212> PRT

<213> Homo sapiens

<400> 569

Gly Tyr Glu Asp Gly Gly Ile His Leu Glu Cys Arg Ser Thr Gly Trp
 1 5 10 15

Tyr Pro Gln Pro Gln Ile Gln
 20

<210> 570

<211> 23

<212> PRT

<213> Homo sapiens

<400> 570

Asn Ile Pro Ala Val Glu Ala Pro Val Val Ala Asp Gly Val Gly Leu
 1 5 10 15

Tyr Glu Val Ala Ala Ser Val
 20

<210> 571

<211> 21

<212> PRT

<213> Homo sapiens

<400> 571

Gln Gln Lys Glu Ile Thr Ala Leu Ser Ser Glu Ile Glu Ser Glu Gln
 1 5 10 15

Glu Met Lys Glu Met

SUBSTITUTE SHEET (RULE 26)

246

20

<210> 572

<211> 24

<212> PRT

<213> Homo sapiens

<400> 572

Leu Arg Glu Ser Leu Gln Glu Glu Leu Lys Arg Lys Lys Ile Gln Tyr
 1 5 10 15

Leu Thr Arg Gly Glu Glu Ser Ser
 20

<210> 573

<211> 13

<212> PRT

<213> Homo sapiens

<400> 573

Gly Glu Glu Met Leu Gln Met Arg Leu His Leu Val Lys
 1 5 10

<210> 574

<211> 40

<212> PRT

<213> Homo sapiens

<400> 574

Ser Ala Gln Phe Ser Val Leu Gly Pro Ser Gly Pro Ile Leu Ala Met
 1 5 10 15

Val Gly Glu Asp Ala Asp Leu Pro Cys His Leu Phe Pro Thr Met Ser
 20 25 30

Ala Glu Thr Met Glu Leu Lys Trp
 35 40

<210> 575

<211> 12

<212> PRT

<213> Homo sapiens

<400> 575

Pro Gln Gly Gly Leu Thr Leu Pro Ser Val Trp Gly
 1 5 10

<210> 576

<211> 106

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

247

<400> 576

Gly Gly Pro Cys His Leu Trp Leu Leu Gly Pro Arg Arg Thr Gln Leu
 1 5 10 15

Pro Gly Arg Arg Ala Ser Leu Pro Phe Arg Ser Gln Gly Glu Leu Thr
 20 25 30

Gln Ala Phe Leu Leu Gly Leu Trp Lys His Gln Met Pro Ala Leu Thr
 35 40 45

Gln Glu Gln Gln Val Arg Ala Glu Arg Arg Arg Glu Ala Val Arg Met
 50 55 60

Glu Ile Pro Gly Leu Phe Phe Ala Ser Leu Ala Asn Trp Gly Leu Leu
 65 70 75 80

Tyr Arg Thr Ser Gln Asp Phe Ile Ser Pro Tyr Leu Cys Ala Ala Pro
 85 90 95

Ser Thr Pro His Pro Pro Leu Gly Gly Pro
 100 105

<210> 577

<211> 23

<212> PRT

<213> Homo sapiens

<400> 577

Gly Pro Arg Arg Thr Gln Leu Pro Gly Arg Arg Ala Ser Leu Pro Phe
 1 5 10 15

Arg Ser Gln Gly Glu Leu Thr
 20

<210> 578

<211> 24

<212> PRT

<213> Homo sapiens

<400> 578

Gln Met Pro Ala Leu Thr Gln Glu Gln Gln Val Arg Ala Glu Arg Arg
 1 5 10 15

Arg Glu Ala Val Arg Met Glu Ile
 20

<210> 579

<211> 25

<212> PRT

<213> Homo sapiens

<400> 579

Ala Asn Trp Gly Leu Leu Tyr Arg Thr Ser Gln Asp Phe Ile Ser Pro
 1 5 10 15

Tyr Leu Cys Ala Ala Pro Ser Thr Pro
 20 25

<210> 580

<211> 34

<212> PRT

<213> Homo sapiens

<400> 580

Leu Ser Phe Lys Asp Lys Ser Thr Tyr Ile Glu Ser Ser Thr Lys Val
 1 5 10 15

Tyr Asp Asp Met Ala Phe Arg Tyr Leu Ser Trp Ile Leu Phe Pro Leu
 20 25 30

Leu Gly

<210> 581

<211> 31

<212> PRT

<213> Homo sapiens

<400> 581

Leu Leu Thr Phe Gly Phe Ile Thr Met Thr Pro Gln Leu Phe Ile Asn
 1 5 10 15

Tyr Lys Leu Lys Ser Val Ala His Leu Pro Trp Arg Met Leu Thr
 20 25 30

<210> 582

<211> 30

<212> PRT

<213> Homo sapiens

<400> 582

Thr Tyr Lys Ala Leu Asn Thr Phe Ile Asp Asp Leu Phe Ala Phe Val
 1 5 10 15

Ile Lys Met Pro Val Met Tyr Arg Ile Gly Cys Leu Arg Asp
 20 25 30

<210> 583

<211> 30

<212> PRT

<213> Homo sapiens

<400> 583

Asp Val Val Phe Phe Ile Tyr Leu Tyr Gln Arg Trp Ile Tyr Arg Val
 1 5 10 15

Asp Pro Thr Arg Val Asn Glu Phe Gly Met Ser Gly Glu Asp

SUBSTITUTE SHEET (RULE 26)

249

20

25

30

<210> 584
 <211> 44
 <212> PRT
 <213> Homo sapiens

<400> 584
 Val Ala Gly Ile Phe Pro Arg Leu Ser Phe Lys Asp Lys Ser Thr Tyr
 1 5 10 15
 Ile Glu Ser Ser Thr Lys Val Tyr Asp Asp Met Ala Phe Arg Tyr Leu
 20 25 30
 Ser Trp Ile Leu Phe Pro Leu Leu Gly Cys Tyr Ala
 35 40

<210> 585
 <211> 19
 <212> PRT
 <213> Homo sapiens

<400> 585
 Trp Ala Ala Met Pro Ser Thr Val Phe Cys Thr Trp Ser Thr Arg Ala
 1 5 10 15
 Gly Thr Pro

<210> 586
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 586
 Pro Trp Val Ala Gly Ile Phe Pro Arg Leu Ser Phe Lys Asp Lys Ser
 1 5 10 15
 Thr Tyr Ile Glu Ser Ser Thr Lys Val Tyr Asp Asp
 20 25

<210> 587
 <211> 88
 <212> PRT
 <213> Homo sapiens

<400> 587
 Ala Gly Glu Asp Ser Cys His Pro Val Leu Ser Val Gln Pro Asp Val
 1 5 10 15
 His Asp Leu Gly Trp Gln Glu Ser Ser Pro Ala Tyr Pro Ser Arg Thr
 20 25 30

SUBSTITUTE SHEET (RULE 26)

250

Ser Pro Arg Ile Ser Ser Pro Arg Pro Lys Cys Met Met Ile Trp His
 35 40 45

Ser Gly Thr Cys Pro Gly Ser Ser Ser Arg Ser Trp Ala Ala Met Pro
 50 55 60

Ser Thr Val Phe Cys Thr Trp Ser Thr Arg Ala Gly Thr Pro Gly Cys
 65 70 75 80

Ser Ala Cys Ser Thr Ala Ser Cys
 85

<210> 588

<211> 30

<212> PRT

<213> Homo sapiens

<400> 588

Leu Ser Val Gln Pro Asp Val His Asp Leu Gly Trp Gln Glu Ser Ser
 1 5 10 15

Pro Ala Tyr Pro Ser Arg Thr Ser Pro Arg Ile Ser Ser Pro
 20 25 30

<210> 589

<211> 25

<212> PRT

<213> Homo sapiens

<400> 589

Gly Ser Ser Ser Arg Ser Trp Ala Ala Met Pro Ser Thr Val Phe Cys
 1 5 10 15

Thr Trp Ser Thr Arg Ala Gly Thr Pro
 20 25

<210> 590

<211> 22

<212> PRT

<213> Homo sapiens

<400> 590

Cys Tyr Ala Val Tyr Ser Leu Leu Tyr Leu Glu His Lys Gly Trp Tyr
 1 5 10 15

Ser Trp Val Leu Ser Met
 20

<210> 591

<211> 12

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

251

<400> 591

Leu Gly Glu Phe Leu Ser Ser Gln Cys Phe Leu Pro
 1 5 10

<210> 592

<211> 20

<212> PRT

<213> Homo sapiens

<400> 592

Arg Ser Arg Arg Asn Arg Val Ala Met Gly Met Trp Ala Ser Leu Asp
 1 5 10 15

Ala Leu Trp Glu
 20

<210> 593

<211> 92

<212> PRT

<213> Homo sapiens

<400> 593

Pro Arg Val Arg Cys Gln Gln Arg Ala Glu Gly Gly Met Gly Ala Gly
 1 5 10 15

Ile Gly Val Gly Pro Ser Glu Arg Thr Asp Ile Ala Val Thr Pro Arg
 20 25 30

Gly Arg Ser Glu Gly Ala Ser Val Gly Val Ala Pro Val His Ala Glu
 35 40 45

Gly Ala Gly Gly Thr Gly Trp Pro Trp Gly Cys Gly His Arg Trp Thr
 50 55 60

Leu Cys Gly Arg Cys Arg Pro Arg Ser Val Ser Ser Gly Pro Cys Cys
 65 70 75 80

Ser Phe Pro Gly Gln Cys Ile Phe Gly Arg Pro Ser
 85 90

<210> 594

<211> 24

<212> PRT

<213> Homo sapiens

<400> 594

Gly Gly Met Gly Ala Gly Ile Gly Val Gly Pro Ser Glu Arg Thr Asp
 1 5 10 15

Ile Ala Val Thr Pro Arg Gly Arg
 20

<210> 595

252

<211> 26
 <212> PRT
 <213> Homo sapiens

<400> 595
 Gly Cys Gly His Arg Trp Thr Leu Cys Gly Arg Cys Arg Pro Arg Ser
 1 5 10 15
 Val Ser Ser Gly Pro Cys Cys Ser Phe Pro
 20 25

<210> 596
 <211> 24
 <212> PRT
 <213> Homo sapiens

<400> 596
 Lys Lys His Gly Phe Asn Gln Gln Thr Leu Gly Phe Phe Thr Trp Lys
 1 5 10 15
 Tyr Asn Lys Asn Lys Asn Leu Val
 20

<210> 597
 <211> 21
 <212> PRT
 <213> Homo sapiens

<400> 597
 Pro Lys Leu Leu Pro Cys Ser Pro Ala Glu Gly His Thr Ser Leu Gly
 1 5 10 15
 Pro Leu Leu Pro Phe
 20

<210> 598
 <211> 70
 <212> PRT
 <213> Homo sapiens

<220>
 <221> SITE
 <222> (6)
 <223> Xaa equals any of the naturally occurring L-amino acids

<400> 598
 Ala Ser Leu Glu Leu Xaa Pro Ser Lys Ser Gln Leu Ser Thr Glu Trp
 1 5 10 15
 Gly Phe Thr Trp Ile Val Gly Leu Gly Met Ser Pro Ser Thr Ala Leu
 20 25 30
 Trp Thr Glu Cys Thr Cys Thr Pro Phe Leu Val Leu Leu Ser His Ala
 35 40 45

SUBSTITUTE SHEET (RULE 26)

Ser Gly His Phe Phe Trp Leu Ser Pro Leu Ala Ser Leu Val Ile Pro
 50 55 60

Pro Val Thr Asp Arg Lys
 65 70

<210> 599

<211> 32

<212> PRT

<213> Homo sapiens

<400> 599

Trp Gly Phe Thr Trp Ile Val Gly Leu Gly Met Ser Pro Ser Thr Ala
 1 5 10 15

Leu Trp Thr Glu Cys Thr Cys Thr Pro Phe Leu Val Leu Leu Ser His
 20 25 30

<210> 600

<211> 106

<212> PRT

<213> Homo sapiens

<400> 600

Val Ala Val Gly Val Cys Arg Glu Asp Val Met Gly Ile Thr Asp Arg
 1 5 10 15

Ser Lys Met Ser Pro Asp Val Gly Ile Trp Ala Ile Tyr Trp Ser Ala
 20 25 30

Ala Gly Tyr Trp Pro Leu Ile Gly Phe Pro Gly Thr Pro Thr Gln Gln
 35 40 45

Glu Pro Ala Leu His Arg Val Gly Val Tyr Leu Asp Arg Gly Thr Gly
 50 55 60

Asn Val Ser Phe Tyr Ser Ala Val Asp Gly Val His Leu His Thr Phe
 65 70 75 80

Ser Cys Ser Ser Val Ser Arg Leu Arg Pro Phe Phe Leu Val Glu Ser
 85 90 95

Ile Ser Ile Phe Ser His Ser Thr Ser Asp
 100 105

<210> 601

<211> 27

<212> PRT

<213> Homo sapiens

254

<400> 601

Ile Thr Asp Arg Ser Lys Met Ser Pro Asp Val Gly Ile Trp Ala Ile
1 5 10 15

Tyr Trp Ser Ala Ala Gly Tyr Trp Pro Leu Ile
20 25

<210> 602

<211> 30

<212> PRT

<213> Homo sapiens

<400> 602

Arg Gly Thr Gly Asn Val Ser Phe Tyr Ser Ala Val Asp Gly Val His
1 5 10 15

Leu His Thr Phe Ser Cys Ser Ser Val Ser Arg Leu Arg Pro
20 25 30

<210> 603

<211> 11

<212> PRT

<213> Homo sapiens

<400> 603

Gly Thr Arg Gly Leu Gln Asn His Arg Thr Glu
1 5 10

<210> 604

<211> 6

<212> PRT

<213> Homo sapiens

<400> 604

Glu Leu Ser Gly Leu Gly
1 5

<210> 605

<211> 6

<212> PRT

<213> Homo sapiens

<400> 605

Met Asp Asp Ile Lys Ile
1 5

<210> 606

<211> 57

<212> PRT

<213> Homo sapiens

<400> 606

SUBSTITUTE SHEET (RULE 26)

255

Asn Phe Cys Val Ser Lys Asn Thr Phe Asn Arg Val Lys Arg Pro Ile
 1 5 10 15

Lys Trp Val Lys Ile Phe Ala Asn Asp Ile Ser Cys Lys Arg Leu Ile
 20 25 30

Ser Arg Ile His Lys Glu Ile Leu Pro Phe Asn Asn Lys Lys Gln Pro
 35 40 45

Asp Phe Lys Val Lys Lys Ser Arg Lys
 50 55

<210> 607

<211> 30

<212> PRT

<213> Homo sapiens

<400> 607

Phe Asn Arg Val Lys Arg Pro Ile Lys Trp Val Lys Ile Phe Ala Asn
 1 5 10 15

Asp Ile Ser Cys Lys Arg Leu Ile Ser Arg Ile His Lys Glu
 20 25 30

<210> 608

<211> 15

<212> PRT

<213> Homo sapiens

<400> 608

Glu Thr Gln Met Ala Asn Lys Tyr Met Lys Arg Cys Ser Thr Leu
 1 5 10 15

<210> 609

<211> 59

<212> PRT

<213> Homo sapiens

<400> 609

Val Ile Arg Glu Leu Gln Val Lys Ala Thr Arg Arg Cys His Tyr Thr
 1 5 10 15

Pro Ile Lys Trp Ser Lys Ser Lys Thr Leu Ile Ser Ser Asn Ala Asp
 20 25 30

Glu Tyr Val Glu Pro Thr Arg Thr Leu Ile His Cys Trp Trp Lys Cys
 35 40 45

Lys Ile Val Gln Pro Leu Cys Lys Thr Ala Trp
 50 55

<210> 610

<211> 22

256

<212> PRT

<213> Homo sapiens

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Thr Leu Ile Ser Ser Asn
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<211> 64

<212> PRT

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Glu Leu Ser Gly Leu Val Ile Ile Thr Ala Trp Ile Ile Leu Cys His
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Ser Ser Ser Lys Asn Pro Val Gly Gly Arg Ile Gln Leu Ala Ile Ala
 20 25 30

Ile Val Ile Thr Leu Phe Pro Phe Ile Ser Trp Val Tyr Ile Tyr Ile
 35 40 45

Asn Lys Glu Met Arg Ser Ser Trp Pro Thr His Cys Lys Thr Val Ile
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<210> 612

<211> 57

<212> PRT

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<400> 612

Gln Cys Pro Gln Gly Thr Glu Thr Glu Ala Gly Val Ser Val Pro Pro
 1 5 10 15

Arg Lys Glu Gly Gly Gly Pro Tyr Val Ala Gly Leu Thr Ala Pro His
 20 25 30

Val Ala Gly Leu Thr Ala Pro Arg Arg Val Leu Arg Ala Met Ala Pro
 35 40 45

Ala Leu Trp Arg Ala Cys Asn Gly Leu
 50 55

<210> 613

<211> 32

<212> PRT

<213> Homo sapiens

SUBSTITUTE SHEET (RULE 26)

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<400> 613

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 1 5 10 15

Ala Ile Val Ile Thr Leu Phe Pro Phe Ile Ser Trp Val Tyr Ile Tyr
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<210> 614

<211> 32

<212> PRT

<213> Homo sapiens

<400> 614

Arg Lys Glu Gly Gly Gly Pro Tyr Val Ala Gly Leu Thr Ala Pro His
 1 5 10 15

Val Ala Gly Leu Thr Ala Pro Arg Arg Val Leu Arg Ala Met Ala Pro
 20 25 30

<210> 615

<211> 32

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (9)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 615

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 20 25 30

<210> 616

<211> 51

<212> PRT

<213> Homo sapiens

<220>

<221> SITE

<222> (3)

<223> Xaa equals any of the naturally occurring L-amino acids

SUBSTITUTE SHEET (RULE 26)

<220>

<221> SITE

<222> (29)

<223> Xaa equals any of the naturally occurring L-amino acids

<400> 616

His Tyr Xaa Ser Thr Pro Gly Arg Val Pro Val Arg Gln Phe Ala Ala
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Ala Ser Thr Ser Gly Gly Pro Trp Val Pro Gly Gly Xaa Leu Glu Ala
 20 25 30

Pro Phe Gln Val Ala Pro Ser Leu Ser His Ser Thr Pro Val Phe Pro
 35 40 45

Gly Leu Ile
 50

<210> 617

<211> 22

<212> PRT

<213> Homo sapiens

<400> 617

Ala Arg Gly Lys Tyr Glu Ser Ala Gln Pro Gly Gly Thr Gln Pro Glu
 1 5 10 15

Pro Gly Leu Gly Ala Arg
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<210> 618

<211> 24

<212> PRT

<213> Homo sapiens

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 1 5 10 15

Leu Ile Asp Phe Ser His Arg Ile
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<210> 619

<211> 52

<212> PRT

<213> Homo sapiens

<400> 619

His Tyr Phe Leu Arg Thr Val Ser Gly Leu Ser Val Val Pro Val Ser
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Leu Arg Cys Cys Met Cys Pro Pro Pro Cys Thr Gly Pro Ala Pro Ala
 20 25 30

SUBSTITUTE SHEET (RULE 26)

<400> 620
Gln Leu Glu Ala Glu Ile Glu Asn Leu Ser Trp Lys Val Glu Arg Ala
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Val Pro Val Ser Leu Arg Cys Cys Met Cys Pro Pro Pro Cys Thr Gly
  1             5             10             15
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<222> (53)

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 1 5 10 15

Gln Arg Thr Arg Arg Arg Gln Thr Ala Gln Leu Ala Leu Gln Val Pro
 20 25 30

Ala Pro Ser Arg Thr Pro Pro Met Ala Thr Asp Val Phe Asn Ser Lys
 35 40 45

Asn Leu Ala Val Xaa Ala Gln Lys Lys Ile Leu Gly Lys Met Val Ser
 50 55 60

Lys Ser Ile Ala Thr Thr Leu Ile Asp Asp Thr Ser Ser Glu Val Leu
 65 70 75 80

Asp Glu Leu Tyr Arg Val Thr Arg Glu Tyr Thr Gln Asn Lys Lys Glu
 85 90 95

Ala Glu Lys Ile Ile Lys Asn Leu Ile Lys Thr Val Ile Lys Leu Ala
 100 105 110

Ile Leu Tyr Arg Asn Asn Gln Phe Asn Gln Asp Glu Leu Ala Leu Met
 115 120 125

Glu Lys Phe Lys Lys Lys Val His Gln Leu Ala Met Thr Val Val Ser
 130 135 140

Phe His Gln Val Asp Tyr Thr Phe Asp Arg Asn Val Leu Ser Arg Leu
 145 150 155 160

Leu Asn Glu Cys Arg Glu Met Leu His Gln Ile Ile Gln Arg His Leu
 165 170 175

Thr Ala Lys Ser His Gly Arg Val Asn Asn Val Phe Asp His Phe Ser
 180 185 190

Asp Cys Glu Phe Leu Ala Ala Leu Tyr Asn Pro Phe Gly Asn Phe Lys
 195 200 205

Pro His Leu Gln Lys Leu Cys Asp Gly Ile Asn Lys Met Leu Asp Glu
 210 215 220

Glu Asn Ile
 225

<210> 624

<211> 52

<212> PRT

<213> Homo sapiens

<400> 624

His Glu Ala Trp Leu Arg Ser Ala Gly Thr Arg Glu Pro Pro Arg Glu

SUBSTITUTE SHEET (RULE 26)

261

1	5	10	15
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Gln Arg Thr Arg Arg Arg Gln Thr Ala Gln Leu Ala Leu Gln Val Pro
 20 25 30

Ala Pro Ser Arg Thr Pro Pro Met Ala Thr Asp Val Phe Asn Ser Lys
 35 40 45

Asn Leu Ala Val
 50

<210> 625
 <211> 49
 <212> PRT
 <213> Homo sapiens

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 Xaa Ala Gln Lys Lys Ile Leu Gly Lys Met Val Ser Lys Ser Ile Ala
 1 5 10 15

Thr Thr Leu Ile Asp Asp Thr Ser Ser Glu Val Leu Asp Glu Leu Tyr
 20 25 30

Arg Val Thr Arg Glu Tyr Thr Gln Asn Lys Lys Glu Ala Glu Lys Ile
 35 40 45

Ile

<210> 626
 <211> 51
 <212> PRT
 <213> Homo sapiens

<400> 626
 Lys Asn Leu Ile Lys Thr Val Ile Lys Leu Ala Ile Leu Tyr Arg Asn
 1 5 10 15

Asn Gln Phe Asn Gln Asp Glu Leu Ala Leu Met Glu Lys Phe Lys Lys
 20 25 30

Lys Val His Gln Leu Ala Met Thr Val Val Ser Phe His Gln Val Asp
 35 40 45

Tyr Thr Phe
 50

<210> 627
 <211> 52

262

<212> PRT

<213> Homo sapiens

<400> 627

Asp Arg Asn Val Leu Ser Arg Leu Leu Asn Glu Cys Arg Glu Met Leu
1 5 10 15

His Gln Ile Ile Gln Arg His Leu Thr Ala Lys Ser His Gly Arg Val
20 25 30

Asn Asn Val Phe Asp His Phe Ser Asp Cys Glu Phe Leu Ala Ala Leu
35 40 45

Tyr Asn Pro Phe
50

<210> 628

<211> 23

<212> PRT

<213> Homo sapiens

<400> 628

Gly Asn Phe Lys Pro His Leu Gln Lys Leu Cys Asp Gly Ile Asn Lys
1 5 10 15

Met Leu Asp Glu Glu Asn Ile
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SUBSTITUTE SHEET (RULE 26)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/27059

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : C07H 21/00; C12N 1/15, 1/21, 5/10, 15/11, 15/63

US CL : 435/91.41, 320.1, 325, 252.3, 254.11; 536/23.1, 23.5, 24.31

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/91.41, 320.1, 325, 252.3, 254.11; 536/23.1, 23.5, 24.31

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

GENBANK, EMBL, SWISS-PROT, SPTREMBL, PIR,
searched: SEQ ID NO: 11-20 & 125-134

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. AA133381, HILLIER et al. 'WashU-Merck EST Project', complete record, 27 November 1996.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. T12400, LIEW et al. 'A catalogue of genes in the cardiovascular system as identified by expressed sequence tags', complete record, 27 November 1996.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. AA496982, HILLIER et al. 'WashU-Merck EST Project 1997', complete record, 12 August 1997.	1, 7-10

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
B earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Z* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

02 MARCH 1999

Date of mailing of the international search report

23 MAR 1999

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

SCOTT D. PRIEBE

Telephone No. (703) 308-0196

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. U14626, D'ALESSIO et al. 'Cloning vector pSVSport1', complete record, 24 May 1995.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. AJ000730, SPERANDEO et al. 'The full cDNA for the human cationic amino acid transporter 3 (HCAT3)', complete record, 02 December 1997.	1
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. R31044, HILLIER et al. 'The WashU-Merck EST Project', complete record, 28 April 1995.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. AA446873, HILLIER et al. 'WashU-Merck EST Project 1997', complete record, 03 June 1997.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. AA135715, HILLIER et al. 'WashU-Merck EST Project', complete record, 14 May 1997.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. AA194015, HILLIER et al. 'WashU-Merck EST Project', complete record, 19 May 1997.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. R72850, HILLIER et al. 'The WashU-Merck EST Project', complete record, 02 June 1995.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. T60940, HILLIER et al. 'WashU-Merck EST Project', complete record, 13 February 1995.	1, 7-10
X	Database GenBank, US National Library of Medicine, (Bethesda, MD, USA), No. H86863, HILLIER et al. 'The WashU-Merck EST Project', complete record, 21 November 1995.	1, 7-10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US98/27059

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-10, 21

Remark on Protest

☐

The additional search fees were accompanied by the applicant's protest.

☐

No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Groups I-XXVII, claim(s) 1-10 and 21, drawn to a polynucleotide, vector comprising same, first claimed method of use, i.e. using polynucleotide to make a cell, and the cell made by the process. Claims 1-10 and 21 recite 114 independent polynucleotides (SEQ ID NO: 11-124 or encoding SEQ ID NO: 125-238). Group I consists of the first ten polynucleotides (SEQ ID NOs 11-20 or encoding SEQ ID NOs 125-134). Each of groups II-XXVII consists of up to four of the remaining 104 polynucleotides, in order.

Groups XXVIII-CXLI, claim(s) 11, 12, 14-16 and 17 (first part), drawn to a polypeptide, a method of making the polypeptide and first claimed method of use, i.e. in treatment. These claims recite 114 independent polypeptides, each of groups XXVIII-CXLI consists of a single polypeptide as set forth in SEQ ID NOs 125-238, respectively.

Groups CXLI-CCLV, claim(s) 13 and 19, drawn to an antibody to a polypeptide and the first claimed method of using same. These claims recite 114 independent antibodies to 114 independent polypeptides, each of groups CXLI-CCLV consists an antibody against a single polypeptide as set forth in SEQ ID NOs 125-238, respectively.

Groups CCLVI-CCLXXXII, claim(s) 17(second part), drawn to an additional method of using a polynucleotide. Group CCLVI consists of methods reciting the first ten polynucleotides (SEQ ID NOs 11-20 or encoding SEQ ID NOs 125-134). Each of groups CCLVII-CCLXXXII pertains to up to four of the remaining 104 polynucleotides, in order.

Groups CCLXXXIII-CCCIX, claim(s) 18, drawn to a second additional method of using a polynucleotide. Group CCLXXXIII consists of methods reciting the first ten polynucleotides (SEQ ID NOs 11-20 or encoding SEQ ID NOs 125-134). Each of groups CCLXXXIV-CCCIX pertains to up to four of the remaining 104 polynucleotides, in order.

Groups CCCX-CDXXXIII, claim(s) 20, drawn to an additional method of using the polypeptide. These claims recite 114 independent methods of using 114 independent polypeptides, each of groups CCCX-CDXXXIII consists an antibody against a single polypeptide as set forth in SEQ ID NOs 125-238, respectively.

Groups CDXXXIV-CDL, claim 22, drawn to a third additional method of using a polynucleotide. Group CDXXXIV consists of methods reciting the first ten polynucleotides (SEQ ID NOs 11-20 or encoding SEQ ID NOs 125-134). Each of groups CDXXXV-CDL pertains to up to four of the remaining 53 polynucleotides, in order.

Claim 23 is unsearchable and cannot be grouped as it is drawn to unknown and unspecified compounds.

The inventions listed as Groups I-CDL do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Each of the corresponding polynucleotides, polypeptides and antibodies are independent products, with different uses and being structurally, biochemically and biologically different products. Additional or alternate methods of use are claimed for individual polynucleotides and polypeptides. 37 CFR 1.475(b) does not provide for unity of invention of more than 1 product or more than one method of using a product as a combination of invention having unity of invention. However, with respect to groups drawn to independent polynucleotides or alternate methods of using same recited in the alternative, in accordance with 1192 O.G. 68 (19 November 1966) applicant is entitled to an initial search of inventions pertaining to the first ten independent polynucleotides recited, and may elect to pay an additional fee for each search of up to four additional independent polynucleotides. For additional method of using each of the independent polynucleotides, applicant may further elect to pay an additional fee for an additional search involving the first ten polynucleotides and each additional search involving up to four additional polynucleotides. With respect to groups pertaining to independent polypeptides or antibodies to the independent polypeptides, each product or method of use is an additional invention. An additional fee must be paid for search of each additional invention relating to polypeptides or antibodies against same. With respect to the relationship between the claimed polynucleotides and the claimed polypeptides, there is no one-to-one correspondence, i.e. no corresponding scope, between claims drawn to polynucleotides and their use and those drawn to polypeptides, antibodies and their use. Consequently, there is no special technical feature linking the polynucleotides and the polypeptides or antibodies claimed.

BNSDCC